Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

December 2005
No. OCT04
REVISED EDITION-B

SERVICE TECHNICAL GUIDE R410A

<Indoor unit>
[Model names] **[Service Ref.]**

PLA-RP·AA — PLA-RP·AA
PLA-RP·AA$_1$
PLA-RP·AA.UK
PLA-RP·AA$_1$.UK

PKA-RP·GAL — PKA-RP·GAL

PKA-RP·FAL — PKA-RP·FAL

PCA-RP·GA — PCA-RP·GA

PEA-RP·EA — PEA-RP·EA.TH-A

PEAD-RP·EA — PEAD-RP·EA.UK PEAD-RP·EA$_1$.UK

PEAD-RP·GA — PEAD-RP·GA.UK

Revision:
- PUHZ-RP•YHA and PUHZ-RP•YHA-A are added in REVISED EDITION-B.
- Some descriptions have been modified.

- Please void OCT04 REVISED EDITION-A.

<Outdoor unit>
[Model names] **[Service Ref.]**

PUHZ-RP·VHA — PUHZ-RP1.6/ 2/ 2.5/ 3/ 4/ 5/ 6VHA
PUHZ-RP2.5/ 3/ 4/ 5/ 6VHA$_1$
PUHZ-RP3/ 4/ 5/ 6VHA-A
PUHZ-RP3/ 4/ 5/ 6VHA$_1$-A

PUHZ-RP·YHA — PUHZ-RP4/ 5/ 6/ 8/ 10YHA
PUHZ-RP8/ 10YHA-A

CONTENTS

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1 PAIRING TABLE OF THE INDOOR AND OUTDOOR UNITS

	Indoor unit		Outdoor unit / Heat pump type								
			Service Manual No. OC294D							OC317	
			PUHZ-RP								
	Service Ref.	Service Manual No.	1.6	2	2.5	3	4	5	6	8	10
			VHA	VHA	VHA VHA$_1$	VHA VHA$_1$	VHA VHA$_1$ YHA	VHA VHA$_1$ YHA	VHA VHA$_1$ YHA	YHA	YHA
Heat pump without electric heater	PEAD-RP•EA.UK PEAD-RP•EA$_1$.UK	MEE04K225	○	○	○	○	○	○	○	○	○
	PEAD-RP•GA.UK	MEE03K219	—	—	○	○	○	—	—	○	○
	PLA-RP•AA PLA-RP•AA$_1$	OC293 REVISED EDITION-B	○	○	○	○	○	○	○	○	○
	PLA-RP•AA.UK PLA-RP•AA$_1$.UK	OC297 REVISED EDITION-E	○	○	○	○	○	○	○	○	○
	PKA-RP•FAL	OC301 REVISED EDITION-A	—	—	○	○	○	—	—	○	○
	PKA-RP•GAL	OC305	○	○	—	—	—	—	—	○	—
	PCA-RP•GA	OC311	—	○	○	○	○	○	○	○	○
	PEH-RP•MYA	MEE04K306	—	—	—	—	—	—	—	○	○

	Indoor unit		Outdoor unit / Heat pump type					
			Service Manual No. OC300C				OC318	
			PUHZ-RP					
	Service Ref.	Service Manual No.	3	4	5	6	8	10
			VHA-A VHA$_1$-A	VHA-A VHA$_1$-A	VHA-A VHA$_1$-A	VHA-A VHA$_1$-A	YHA-A	YHA-A
Heat pump without electric heater	PLA-RP•AA PLA-RP•AA$_1$	OC293 REVISED EDITION-B	○	○	○	○	○	○
	PEA-RP•EA.TH-A	OC299 REVISED EDITION-A	○	○	○	○	○	○
	PKA-RP•FAL	OC301 REVISED EDITION-A	○	○	—	—	○	○
	PCA-RP•GA	OC311	○	○	○	○	○	○
	PEH-RP•MYA	MEE04K306	—	—	—	—	○	○

2 SPECIFICATIONS FOR ELECTRICAL WORK

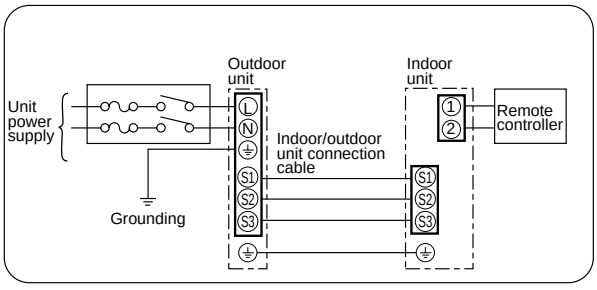
2-1. FIELD ELECTRICAL WIRING(power wiring specifications)
PUHZ-RP•VHA PUHZ-RP4, 5, 6YHA
PUHZ-RP•VHA-A

Indoor unit model		RP1.6, 2V	RP2.5, 3V	RP4, 5V	RP6V	RP4, 5, 6Y
Outdoor unit power supply		~ / N (Single) 50Hz, 220-230-240V				3N~ (3 phase) 50Hz, 380-400-415V
Outdoor unit input capacity *1 Main switch (Breaker)		16A	25A	32A	40A	16A
Wiring Wire No. × size (mm^2)	Outdoor unit power supply	2 × Min. 1.5	2 × Min. 2.5	2 × Min. 4	2 × Min. 6	4 × Min. 1.5
	Outdoor unit power supply earth	1 × Min. 1.5	1 × Min. 2.5	1 × Min. 4	1 × Min. 6	1 × Min. 1.5
	Indoor unit - Outdoor unit *2	3 × 2.5(polar)	3 × 2.5(polar)	3 × 2.5 (polar)	3 × 2.5(polar)	3 × 2.5(polar) *5
	Indoor unit - Outdoor unit earth	1 × Min. 2.5	1 × Min. 2.5	1 × Min. 2.5	1 × Min. 2.5	1 × Min. 2.5
	Remote controller - Indoor unit *3	2 × 0.69 (Non-polar)				
Circuit rating	Outdoor unit L-N *4	AC 220-230-240V				
	Indoor unit-Outdoor unit S1-S2 *4	AC220-230-240V				
	Indoor unit-Outdoor unit S2-S3 *4	DC24V				
	Remote controller - Indoor unit *4	DC14V				

*1 A breaker with at least 3mm contact separation in each poles shall be provided.
Use non-fuse breaker (NF) or earth leakage breaker (NV).
*2 Max. 50m Total Max, including all indoor/ indoor connection is 80m.
*3 10m wire is attached in the remote controller accessory.
*4 The figures are NOT always against the ground.
S3 terminal has DC24V against S2 terminal. However, between S3 and S1, these terminals are NOT electrically insulated by the transformer or other device.
*5 Use shield wires.

Notes: 1. Wiring size must comply with the applicable local and national code.
2. Power supply cords and indoor/ Outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (design 254 IEC 57)
3. Install an earth longer and thicker than other cables.

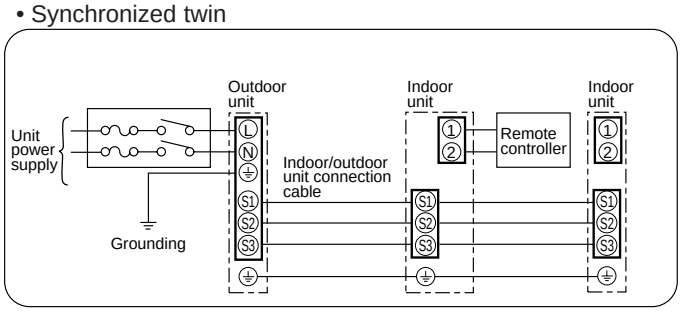
1:1 system



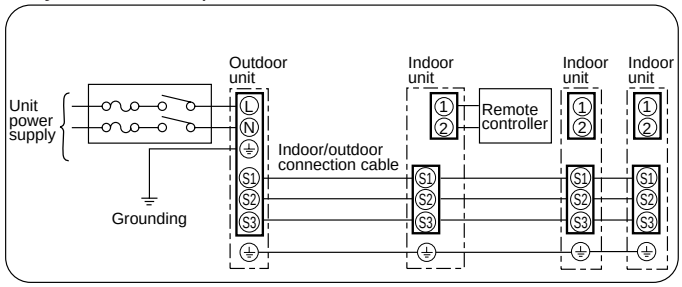
※ Refer to ELECTRICAL WIRING of PUHZ-RP4, 5, 6YHA to next page.

Synchronized twin and triple system Electrical wiring

• Synchronized twin



• Synchronized triple



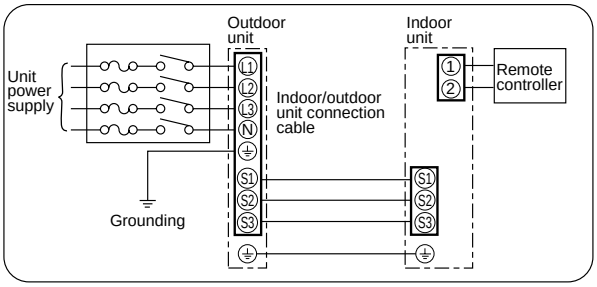
PUHZ-RP8, 10YHA
PUHZ-RP8, 10YHA-A

Models (Outdoor unit)		RP8	RP10
Outdoor unit Power supply	Phase	3N~(3ph 4wires)	
	Frequency & Voltage	50Hz, 380-400-415V	
Input capacity Main switch/Breaker	Outdoor unit (A)	32	32
Wiring: Outdoor unit Power supply	Wire No.	4	4
Wiring: Indoor unit/Outdoor unit connecting Wire No. × size (mm²)		Cable length 50 m : 3 × 4 (Polar) Cable length 80 m : 3 × 6 (Polar)	
Wiring: Remote controller-indoor unit connecting Wire No. × size (mm²)		Cable 2C × 0.69 This wire is accessory of remote controller (Wire length: 10m, Non-polar)	
Control circuit rating		Indoor unit-Outdoor unit: S1-S2 AC220V-230V-240V S2-S3 DC24V Remote controller-Indoor unit: DC14V	

Check items

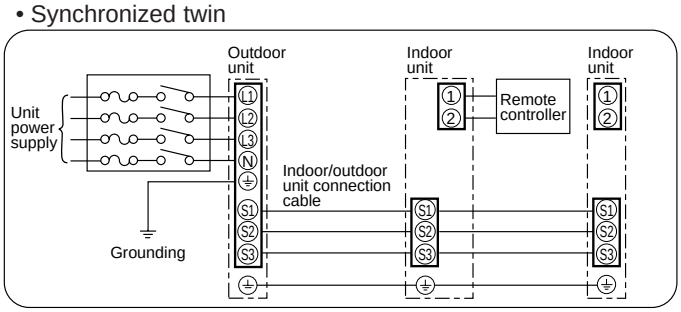
1. Wiring size must comply with the applicable local and national code.
2. Be careful about choosing the installation location for the earth leakage breaker and how it is installed as the initial electric current may cause it to malfunction.
3. Power supply cords and indoor unit / Outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (design 254 IEC 57)

1:1 system

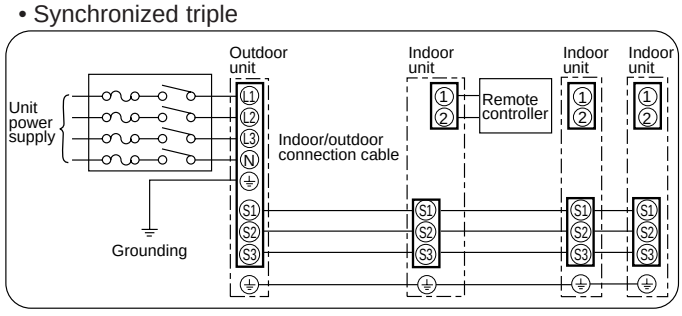


Synchronized twin, triple and quadruple system Electrical wiring

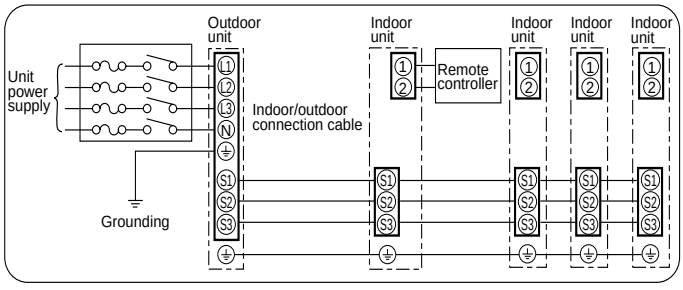
• Synchronized twin



• Synchronized triple



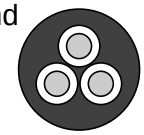
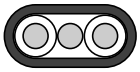
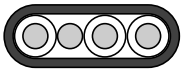
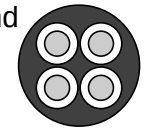
• Synchronized quadruple



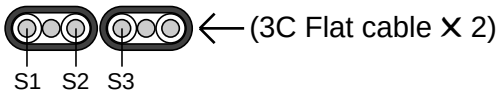
2-2. WIRING SPECIFICATIONS

2-2-1. INDOOR UNIT – OUTDOOR UNIT WIRING FOR PUHZ-RP1.6-6VHA(-A) and PUHZ-RP1.6-6VHA$_1$(-A)

The cable shall not be lighter than design 245 IEC or 227 IEC.
The cable length may vary depending on the condition of installation, humidity or materials, etc.

Cross section of cable	Wire size (mm^2)	Number of wires	Polarity	L(m) ✻5
Round 	2.5	3	Clockwise : S1-S2-S3	(50) ✻1
Flat 	2.5	3	Not applicable (Because center wire has no cover finish)	Not applicable ✻2
Flat 	1.5	4	From left to right : S1-Open-S2-S3	(45) ✻3
Round 	2.5	4	Clockwise : S1-S2-S3-Open Connect S1 and S3 to the opposite angle	60 ✻4

✻1 : In case that cable with stripe of yellow and green is available.
✻2 : In the flat cables are connected as this picture, they can be used up to 80m.



✻3 : In case of regular polarity connection (S1-S2-S3), wire size is 1.5mm^2.
✻4 : In case of regular polarity connection (S1-S2-S3).
✻5 : Mentioned cable length is just a reference value.
It may be different depending on the condition of installation, humidity or materials, etc.

Be sure to connect the indoor-outdoor connecting cables directly to the units (no intermediate connections).
Intermediate connections can lead to communication errors if water enters the cables and causes insufficient insulation to ground or a poor electrical contact at the intermediate connection point.
(If an intermediate connection is necessary, be sure to take measures to prevent water from entering the cables.)

2-2-2. INDOOR UNIT – OUTDOOR UNIT WIRING FOR PUHZ-RP4, 5, 6YHA

The cable shall not be lighter than design 245 IEC or 227 IEC.

For 4, 5, 6Y application, use shield wire. (**For EMC DIRECTIVE**)
The shield part must be grounded with the indoor unit or the outdoor unit, not with both.

The cable length may depending on the condition of installation, humidity or materials, etc.

	Wire No. × Size (㎟)		
	Max. 45m	Max. 50m	Max. 80m
Indoor unit-Outdoor unit	3 × 1.5 (polar)	3 × 2.5 (polar)	3 × 2.5 (polar) and S3 separated
Indoor unit-Outdoor unit earth	1 × Min. 1.5	1 × Min. 2.5	1 × Min. 2.5

If 1.5㎟ used, Max. 45m.
If 2.5㎟ used, Max. 50m.
If 2.5㎟ used and S3 separated, Max. 80m.

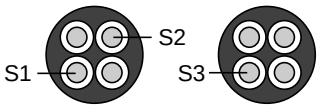
When the shield line is not used, several dB is exceeded with 30 ~ 40 MHz .
(There is a possibility to be used by the wireless for the ship etc. though it is not used for radio and TV.)

Be sure to connect the indoor-outdoor connecting cables directly to the units (no intermediate connections).
Intermediate connections can lead to communication errors if water enters the cables and causes insufficient insulation to ground or a poor electrical contact at the intermediate connection point.
(If an intermediate connection is necessary, be sure to take measures to prevent water from entering the cables.)

2-2-3. INDOOR UNIT – OUTDOOR UNIT WIRING FOR PUHZ-RP8, 10YHA(-A)

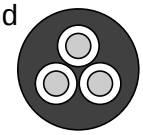
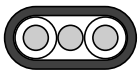
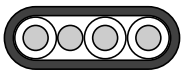
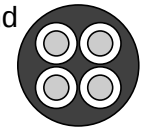
The cable shall not be lighter than design 245 IEC or 227 IEC.

When cable length is 30m or more.
Use one cable for S1 and S2 and another for S3 as shown in the picture.

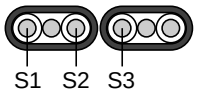


wire size :
cable length 50m : 4mm^2
cable length 80m : 6mm^2

The cable length may vary depending on the condition of installation, humidity or materials, etc.

Cross section of cable	Wire size (mm^2)	Number of wires	Polarity	L(m) ✻5
Round 	2.5	3	Clockwise : S1-S2-S3	(30) ✻1
Flat 	2.5	3	Not applicable (Because center wire has no cover finish)	Not applicable ✻2
Flat 	1.5	4	From left to right : S1-Open-S2-S3	(18) ✻3
Round 	2.5	4	Clockwise : S1-S2-S3-Open Connect S1 and S3 to the opposite angle	30 ✻4

✻1 : In case that cable with stripe of yellow and green is available.
✻2 : In the flat cables are connected as this picture, they can be used up to 30m.



✻3 : In case of regular polarity connection (S1-S2-S3), wire size is 1.5mm^2.
✻4 : In case of regular polarity connection (S1-S2-S3).
✻5 : Mentioned cable length is just a reference value.
It may be different depending on the condition of installation, humidity or materials, etc.

Be sure to connect the indoor-outdoor connecting cables directly to the units (no intermediate connections).
Intermediate connections can lead to communication errors if water enters the cables and causes insufficient insulation to ground or a poor electrical contact at the intermediate connection point.
(If an intermediate connection is necessary, be sure to take measures to prevent water from entering the cables.)

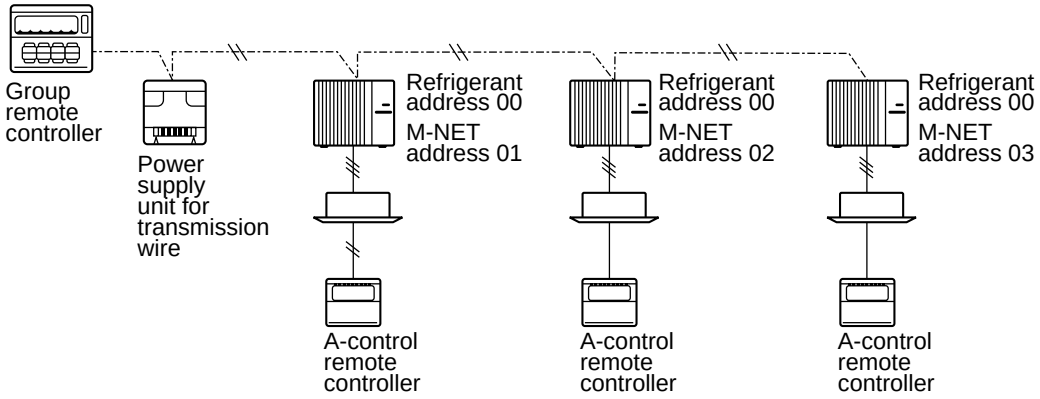
2-3. M-NET WIRING METHOD

(Points to notice)

(1) Outside the unit, transmission wires should stay away from electric wires in order to prevent electromagnetic noise from making an influence on the signal communication. Place them at intervals of more than 5cm. Do not put them in the same conduit tube.

(2) Terminal block (TB7) for transmission wires should never be connected to 220~240V power supply. If it is connected, electronic parts on M-NET p.c. board may be burn out.

(3) Use 2-core x 1.25mm^2 shield wire (CVVS, CPEVS) for the transmission wire. Transmission signals may not be sent or received normally if different types of transmission wires are put together in the same multi-conductor cable. Never do this because this may cause a malfunction.

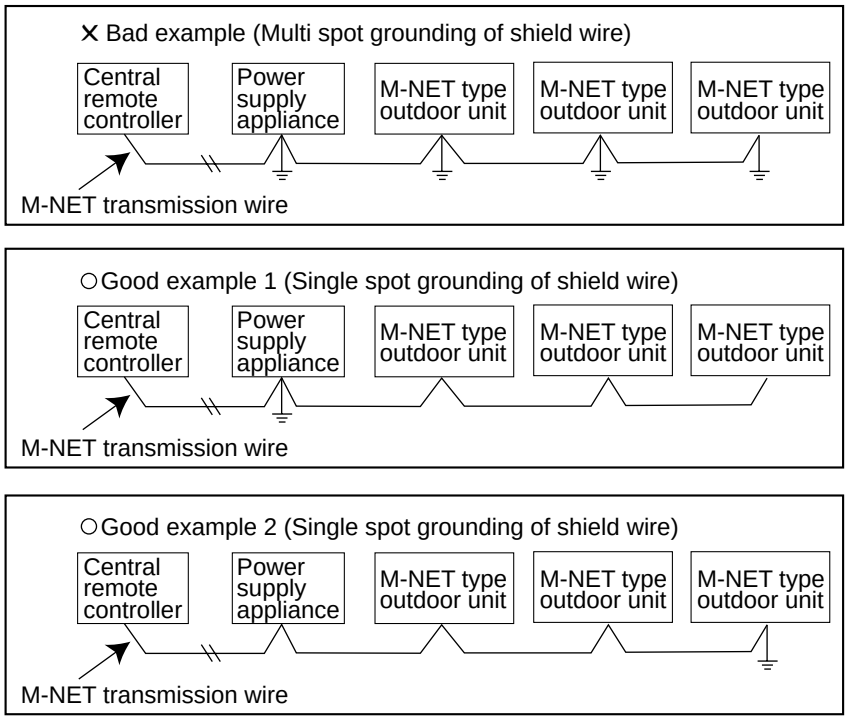


It would be ok if M-NET wire (non-polar, 2-cores) is arranged in addition to the wiring for A-control.

(4) Ground only one of any appliances through M-NET transmission wire (shield wire). Communication error may occur due to the influence of electromagnetic noise.

"Ed" error will appear on the LED display of outdoor unit.

"0403" error will appear on the central-control remote controller.

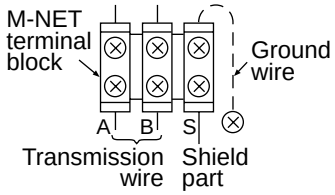


If there are more than two grounding spots on the shield wire, noise may enter into the shield wire because the ground wire and shield wire form one circuit and the electric potential difference occurs due to the impedance difference among grounding spots. In case of single spot grounding, noise does not enter into the shield wire because the ground wire and shield wire do not form one circuit.

To avoid communication errors caused by noise, make sure to observe the single spot grounding method described in the installation manual.

● **M-NET wiring**

(1) Use 2-core x 1.25mm^2 shield wire for electric wires.
(Excluding the case connecting to system controller.)
(2) Connect the wire to the M-NET terminal block.Connect one core of the transmission wire (non-polar) to A terminal and the other to B. Peel the shield wire, twist the shield part to a string and connect it to S terminal.
(3) In the system which several outdoor units are being connected, the terminal (A, B, S) on M-NET terminal block should be individually wired to the other outdoor unit's terminal, i.e. A to A, B to B and S to S.In this case, choose one of those outdoor units and drive a screw to fix an ground wire on the plate as shown on the right figure.



2-3-1. M-NET address setting

In A-control models, M-NET address and refrigerant address should be set only for the outdoor unit. Similar to Free Combo system, there is no need to set the address of outdoor unit and remote controller. To construct a central control system, the setting of M-NET address should be conducted only upon the outdoor unit. The setting range should be 1 to 50 (the same as that of the indoor unit in Free Combo system), and the address number should be consecutively set in a same group.

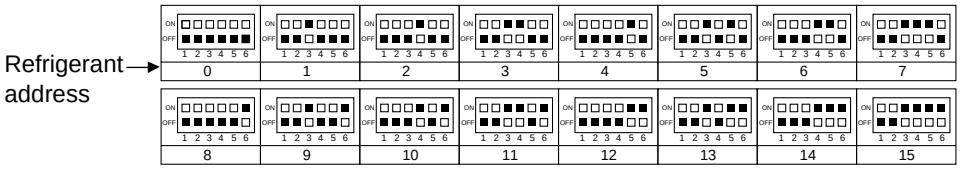
Address number can be set by using rotary switches (SW11 for ones digit and SW12 for tens digit), which is located on the M-NET board of outdoor unit.
(Factory setting: all addresses are set to "0".)

<Setting example>

M-NET Address No.		1	2	~	50
Switng setting	SW11 ones digit				
	SW12 tens digit				

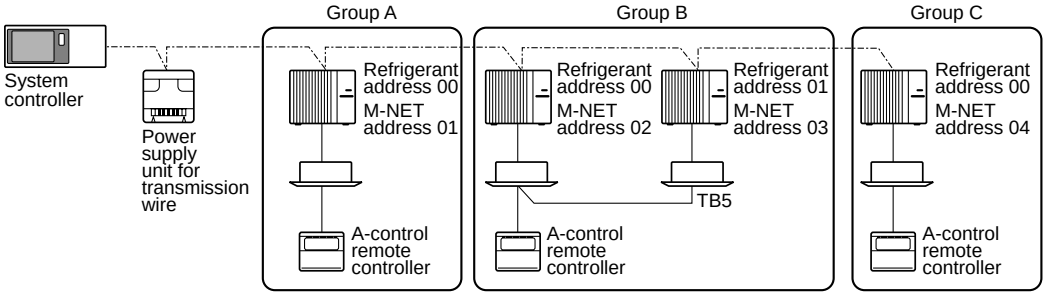
2-3-2. Refrigerant address setting

In case of multiple grouping system (multiple refrigerant circuits in one group), indoor units should be connected by remote controller wiring (TB5) and the refrigerant address needs to be set. Leave the refrigerant addresses to "00" if the group setting is not conducted. Set the refrigerant address by using DIP SW1-3 to -6 on the outdoor controller board. [Factory setting: all switches are OFF. (All refrigerant addresses are "00".)]

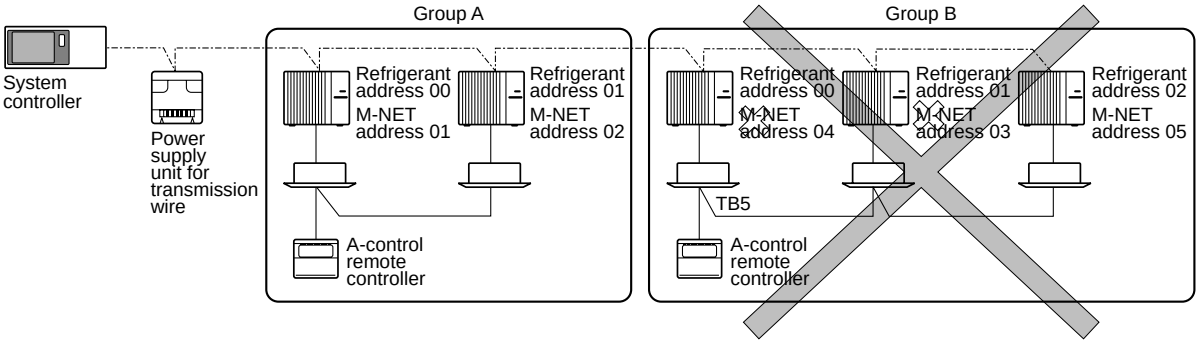


2-3-3. Regulations in address settings

In case of multiple grouping system, M-NET and refrigerant address settings should be done as explained in the above section. Set the lowest number in the group for the outdoor unit whose refrigerant address is "00" as its M-NET address.



※ Refrigerant addresses can be overlapped if they are in the different group.



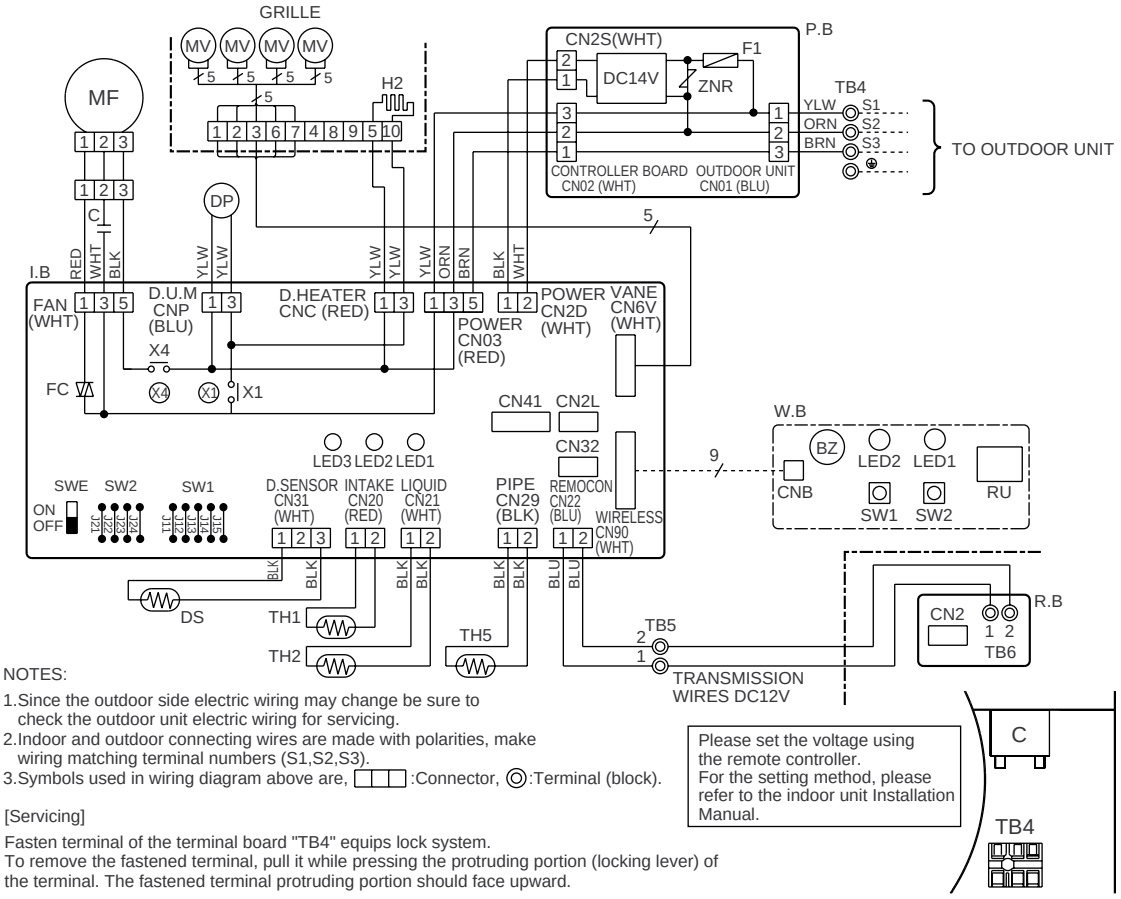
※ In group B, M-NET address of the outdoor unit whose refrigerant address is "00" is not set to the minimum in the group. As "3" is right for this situation, the setting is wrong. Taking group A as a good sample, set the minimum M-NET address in the group for the outdoor unit whose refrigerant address is "00".

3 WIRING DIAGRAM

PLA-RP1.6AA **PLA-RP2AA** **PLA-RP2.5AA**
PLA-RP1.6AA.UK **PLA-RP2AA.UK** **PLA-RP2.5AA.UK**
PLA-RP3AA **PLA-RP4AA** **PLA-RP5AA** **PLA-RP6AA**
PLA-RP3AA$_1$ **PLA-RP4AA$_1$** **PLA-RP5AA$_1$** **PLA-RP6AA$_1$**
PLA-RP3AA.UK **PLA-RP4AA.UK** **PLA-RP5AA.UK** **PLA-RP6AA.UK**
PLA-RP3AA$_1$.UK **PLA-RP4AA$_1$.UK** **PLA-RP5AA$_1$.UK** **PLA-RP6AA$_1$.UK**

[LEGEND]

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
P.B	INDOOR POWER BOARD	MV	VANE MOTOR	W.B	WIRELESS REMOTE CONTROLLER BOARD
F1	FUSE (4A)	DP	DRAIN PUMP	RU	RECEIVING UNIT
ZNR	VARISTOR	DS	DRAIN SENSOR	BZ	BUZZER
I.B	INDOOR CONTROLLER BOARD	H2	DEW PREVENTION HEATER	LED1	LED (RUN INDICATOR)
CN2L	CONNECTOR (LOSSNAY)	TB4	TERMINAL BLOCK (INDOOR/OUTDOOR CONNECTING LINE)	LED2	LED (HOT ADJUST)
CN32	CONNECTOR (REMOTE SWITCH)	TB5	TERMINAL BLOCK (REMOTE CONTROLLER TRANSMISSION LINE)	SW1	SWITCH (HEATING ON/OFF)
CN41	CONNECTOR (HA TERMINAL-A)			SW2	SWITCH (COOLING ON/OFF)
SW1	JUMPER WIRE (MODEL SELECTION)	TH1	ROOM TEMPERATURE THERMISTOR (0℃/15kΩ, 25℃/5.4kΩ DETECT)		
SW2	JUMPER WIRE (CAPACITY CORD)				
SWE	SWITCH (EMERGENCY OPERATION)	TH2	PIPE TEMPERATURE THERMISTOR/LIQUID (0℃/15kΩ, 25℃/5.4kΩ DETECT)		
X1	RELAY (DRAIN PUMP)				
X4	RELAY (FAN MOTOR)	TH5	COND./EVA. TEMPERATURE THERMISTOR (0℃/15kΩ, 25℃/5.4kΩ DETECT)		
FC	FAN PHASE CONTROL				
LED1	POWER SUPPLY (I.B)	R.B	REMOTE CONTROLLER BOARD		
LED2	POWER SUPPLY (I.B)	CN2	CONNECTOR (PROGRAM TIMER)		
LED3	TRANSMISSION (INDOOR-OUTDOOR)	TB6	TERMINAL BLOCK (REMOTE CONTROLLER TRANSMISSION LINE)		
C	CAPACITOR (FAN MOTOR)				
MF	FAN MOTOR				



NOTES:

1. Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2. Indoor and outdoor connecting wires are made with polarities, make wiring matching terminal numbers (S1,S2,S3).
3. Symbols used in wiring diagram above are, ☐☐☐ :Connector, ◎ :Terminal (block).

Please set the voltage using the remote controller.
For the setting method, please refer to the indoor unit Installation Manual.

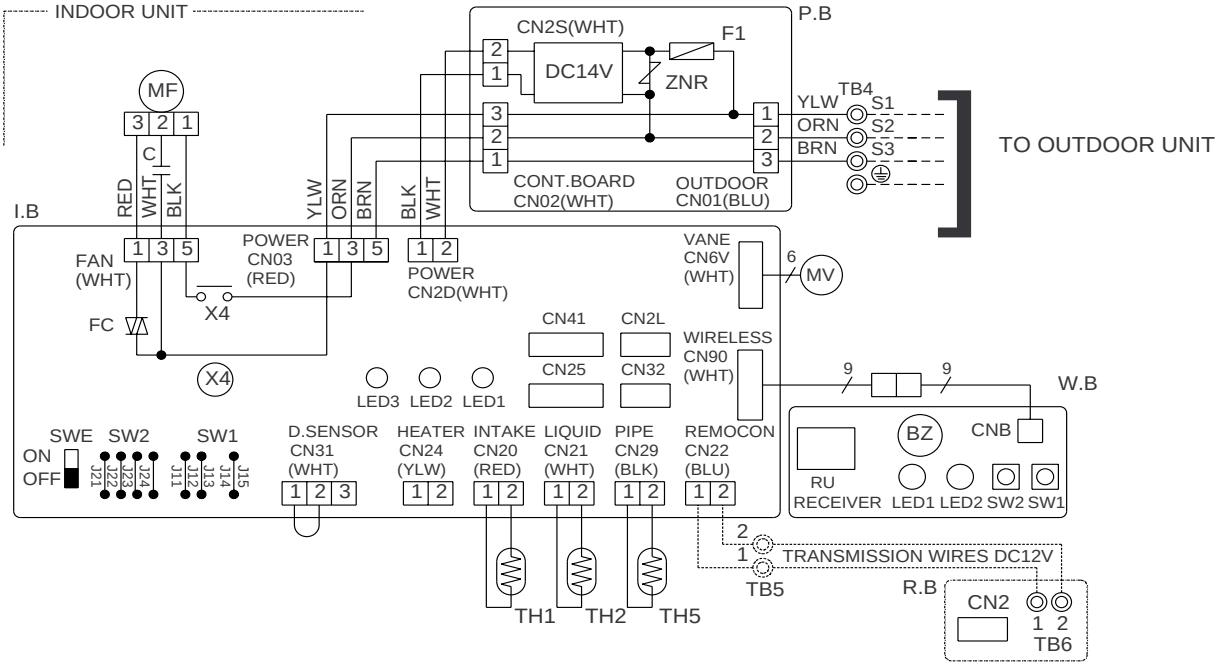
[Servicing]

Fasten terminal of the terminal board "TB4" equips lock system.
To remove the fastened terminal, pull it while pressing the protruding portion (locking lever) of the terminal. The fastened terminal protruding portion should face upward.

SW1		
MODELS	Manufacture	Service board
PLA-RP1.6,2,2.5AA PLA-RP3,4,5,6AA PLA-RP3,4,5,6AA$_1$	J11J12J13J14J15	1 2 3 4 5 ON OFF

SW2					
MODELS	Manufacture	Service board	MODELS	Manufacture	Service board
PLA-RP1.6AA	J21J22J23J24	1 2 3 4 ON OFF	PLA-RP4AA PLA-RP4AA$_1$	J21J22J23J24	1 2 3 4 ON OFF
PLA-RP2AA	J21J22J23J24	1 2 3 4 ON OFF	PLA-RP5AA	J21J22J23J24	1 2 3 4 ON OFF
PLA-RP2.5AA	J21J22J23J24	1 2 3 4 ON OFF	PLA-RP5AA$_1$ PLA-RP6AA PLA-RP6AA$_1$	J21J22J23J24	1 2 3 4 ON OFF
PLA-RP3AA PLA-RP3AA$_1$	J21J22J23J24	1 2 3 4 ON OFF			

PKA-RP1.6GAL PKA-RP2GAL



Please set the voltage using the remote controller.
For the setting method,please refer to the indoor unit Installation Manual.

SW1		SW2					
Manufacture	Service board	MODELS	Manufacture	Service board	MODELS	Manufacture	Service board
J11 J12 J13 J14 J15	1 2 3 4 5 ON OFF	1.6GAL	J21 J22 J23 J24	1 2 3 4 ON OFF	2GAL	J21 J22 J23 J24	1 2 3 4 ON OFF

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
P.B	INDOOR POWER BOARD	C	CAPACITOR(FAN MOTOR)	W.B	WIRELESS REMOTE CONTROLLER BOARD
F1	FUSE(4A)	MF	FAN MOTOR	RU	RECEIVING UNIT
ZNR	VARISTOR	MV	VANE MOTOR	BZ	BUZZER
I.B	INDOOR CONTROLLER BOARD	TB4	TERMINAL BLOCK(INDOOR/OUTDOOR CONNECTING LINE)	LED1	LED(RUN INDICATOR)
CN2L	CONNECTOR(LOSSNAY)			LED2	LED(HOT ADJUST)
CN32	CONNECTOR(REMOTE SWITCH)	TB5	TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)(OPTION)	SW1	SWITCH(HEATING ON/OFF)
CN41	CONNECTOR(HA TERMINAL-A)			SW2	SWITCH(COOLING ON/OFF)
SW1	JUMPER WIRE(MODEL SELECTION)	TH1	ROOM TEMP.THERMISTOR (0°C/15kΩ,25°C/5.4kΩ DETECT)	R.B	REMOTE CONTROLLER BOARD(OPTION)
SW2	JUMPER WIRE(CAPACITY CORD)			CN2	CONNECTOR(PROGRAM TIMER)
SWE	SWITCH(EMERGENCY OPERATION)	TH2	PIPE TEMP.THERMISTOR/LIQUID (0°C/15kΩ,25°C/5.4kΩ DETECT)	TB6	TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)
X4	RELAY(FAN MOTOR)				
FC	FAN PHASE CONTROL	TH5	COND./EVA.TEMP.THERMISTOR (0°C/15kΩ,25°C/5.4kΩ DETECT)		
LED1	POWER SUPPLY(I.B)				
LED2	POWER SUPPLY(R.B)				
LED3	TRANSMISSION(INDOOR-OUTDOOR)				

NOTES:
1.Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2.Indoor and outdoor connecting wires are made with polarities,make wiring matching terminal numbers(S1,S2,S3).
3.Make sure that the main power supply of the booster heater is independent.
4.Symbols used in wiring diagram above are, □□□ :Connector, ◎ :Terminal (block).

[Self-diagnosis]

An explanation of the wireless remote controller self checking operations,check codes,buzzer sounds and LED signals are given below. For check codes and symptom see the table below please.

1.Press the CHECK button twice continuously.
- CHECK begins to light and refrigerant address display "00" begins to blink.
- Start this operation from the status of remote controller display turned off.

2.Press the TEMP ▼,▲ buttons.
- Set the refrigerant address of the indoor unit that is to be self-diagnosed.
- Set the refrigerant address of outdoor unit by outdoor unit dip switch "SW1". (Refer to installation manual of outdoor unit for the detail.)

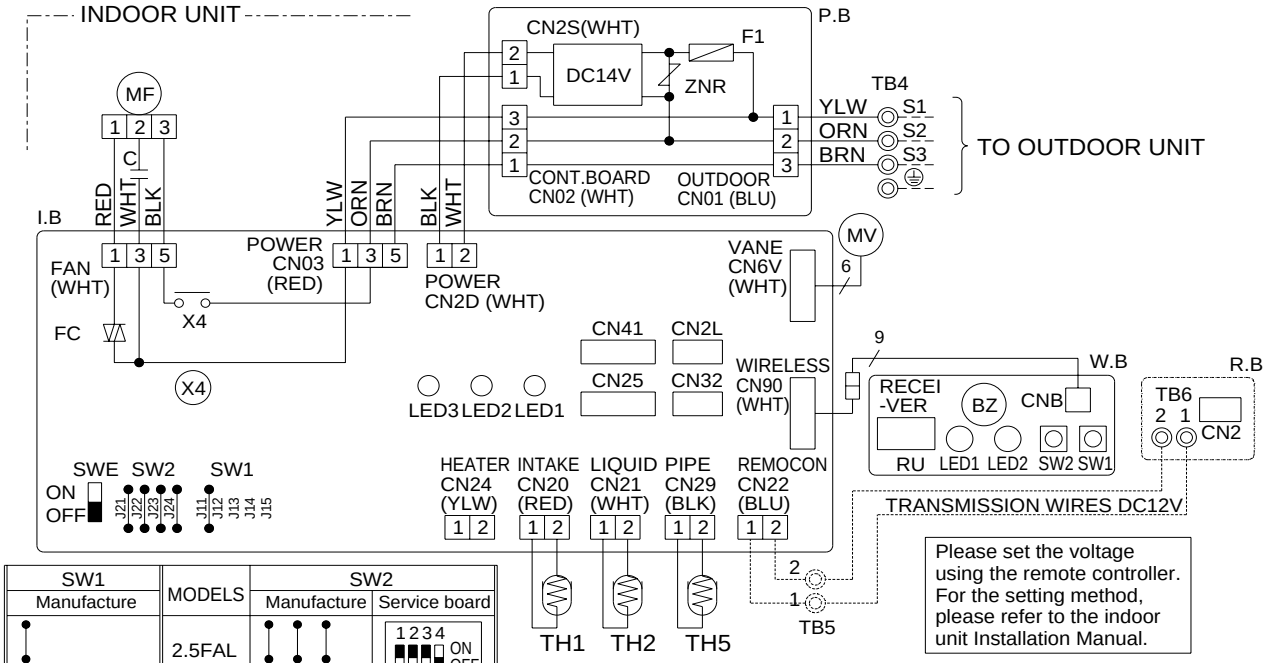
3.While pointing the remote controller toward the unit's receiver, press the h button.
- The check code will be indicated by the number of times that the buzzer sounds from the receiver section and the number of blinks of the operation lamp.

4.While pointing the remote controller toward the unit's receiver, press the ON/OFF ⏻ button.
- Self-check mode is canceled.

Check code	Operation lamp	Buzzer sound	Symptom
P1	1SEC.FLASH×1	Single beep×1	Abnormality of room temperature thermistor(TH1).
P2	1SEC.FLASH×2	Single beep×2	Abnormality of pipe temperature thermistor/Liquid(TH2).
P6	1SEC.FLASH×6	Single beep×6	Freezing /overheating protection is working.
P8	1SEC.FLASH×8	Single beep×8	Abnormality of pipe temperature.
P9	1SEC.FLASH×2	Single beep×2	Abnormality of pipe temperature thermistor/ Cond./Eva.(TH5).
U0~UL	(0.4+0.4)SEC.FLASH×1	Double beep×1	Abnormality in outdoor unit. Refer to outdoor unit wiring diagram.
F1~F9			
E6~EF	DIFFERENT FROM ABOVE	Sounds other than above	Abnormality of signal transmission between indoor unit and outdoor unit ("EE" indicates abnormality of combination).
----	OFF	No sound	No trouble generated in the past.
FFFF	OFF	Triple beep	No corresponding unit.

PKA-RP2.5FAL PKA-RP3FAL PKA-RP4FAL

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
P.B	INDOOR POWER BOARD	C	CAPACITOR(FAN MOTOR)	W.B	WIRELESS REMOTE CONTROLLER BOARD
F1	FUSE(4A)	MF	FAN MOTOR	RU	RECEIVING UNIT
ZNR	VARISTOR	MV	VANE MOTOR	BZ	BUZZER
I.B	INDOOR CONTROLLER BOARD	TB4	TERMINAL BLOCK(INDOOR/OUTDOOR CONNECTING LINE)	LED1	LED(RUN INDICATOR)
CN2L	CONNECTOR(LOSSNAY)			LED2	LED(HOT ADJUST)
CN32	CONNECTOR(REMOTE SWITCH)	TB5	TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)(OPTION)	SW1	SWITCH(HEATING ON/OFF)
CN41	CONNECTOR(HA TERMINAL-A)			SW2	SWITCH(COOLING ON/OFF)
SW1	JUMPER WIRE(MODEL SELECTION)	TH1	ROOM TEMPERATURE THERMISTOR (0°C/15kΩ, 25°C/5.4kΩ DETECT)	R.B	REMOTE CONTROLLER BOARD(OPTION)
SW2	JUMPER WIRE(CAPACITY CODE)			CN2	CONNECTOR(SCHEDULE TIMER)
SWE	SWITCH(EMERGENCY OPERATION)	TH2	PIPE TEMPERATURE THERMISTOR/LIQUID (0°C/15kΩ, 25°C/5.4kΩ DETECT)	TB6	TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)
X4	RELAY(FAN MOTOR)				
FC	FAN PHASE CONTROL	TH5	CONDENSER / EVAPORATOR TEMPERATURE THERMISTOR (0°C/15kΩ, 25°C/5.4kΩ DETECT)		
LED1	POWER SUPPLY(I.B)				
LED2	POWER SUPPLY(R.B)				
LED3	TRANSMISSION(INDOOR-OUTDOOR)				



SW1 Manufacture	MODELS	SW2 Manufacture	SW2 Service board
J11J12J13J14J15	2.5FAL	J21J22J23J24	1234 ON OFF
Service board 12345 ON OFF	3FAL	J21J22J23J24	1234 ON OFF
	4FAL	J21J22J23J24	1234 ON OFF

NOTES:
1.Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2.Indoor and outdoor connecting wires are made with polarities, make wiring matching terminal numbers(S1, S2, S3).
3.Symbols used in wiring diagram above are, □□□:Connector, ◎:Terminal (block).

[Self-diagnosis]
An explanation of the wireless remote controller self checking operations, check codes, buzzer sounds and LED signals are given below. For check codes and symptom see the table below please.

1.Press the CHECK button twice continuously.
- CHECK begins to light and refrigerant address display "00" begins to blink.
- Start this operation from the status of remote controller display turned off.

2.Press the TEMP ▼ , ▲ buttons.
- Set the refrigerant address of the indoor unit that is to be self-diagnosed.
- Set the refrigerant address of outdoor unit by outdoor unit dip switch "SW1".
  (Refer to installation manual of outdoor unit for the detail.)

3.While pointing the remote controller toward the unit's receiver, press the h button.
- The check code will be indicated by the number of times that the buzzer sounds from the receiver section and the number of blinks of the operation lamp.

4.While pointing the remote controller toward the unit's receiver, press the ON/OFF ◎ button.
- Self-check mode is canceled.

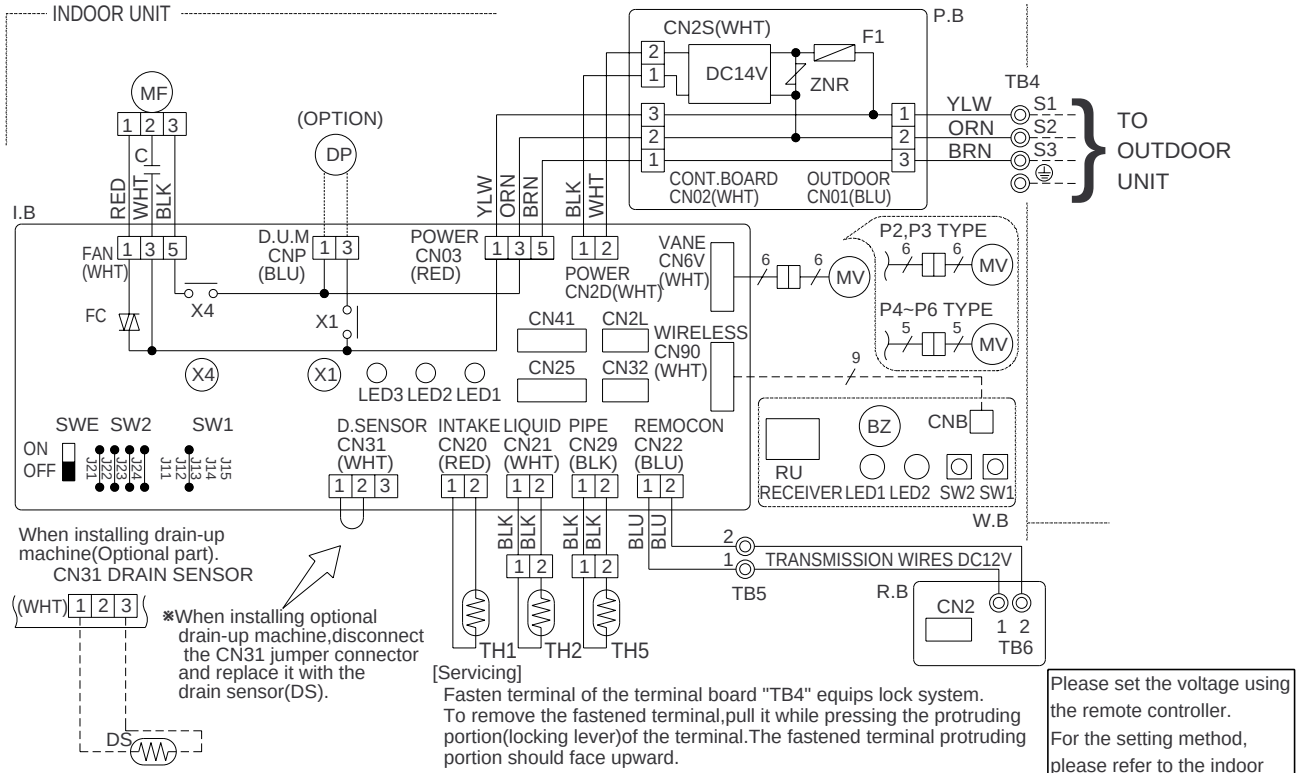
Check code	Operation lamp	Buzzer sound	Symptom
P1	1SEC.FLASH X 1	Single beep X 1	Abnormality of room temperature thermistor(TH1).
P2	1SEC.FLASH X 2	Single beep X 2	Abnormality of pipe temperature thermistor/Liquid(TH2).
P4	1SEC.FLASH X 4	Single beep X 4	Abnormality of drain sensor(DS).
P5	1SEC.FLASH X 5	Single beep X 5	Malfunction of drain-up machine.
P6	1SEC.FLASH X 6	Single beep X 6	Freezing /overheating protection is working.
P8	1SEC.FLASH X 8	Single beep X 8	Abnormality of pipe temperature.
P9	1SEC.FLASH X 2	Single beep X 2	Abnormality of pipe temperature thermistor/ Condenser/Evaporator(TH5).
U0~UL	(0.4+0.4)SEC.FLASH X 1	Double beep X 1	Abnormality in outdoor unit. Refer to outdoor unit wiring diagram.
F1~F9			
E6~EF	DIFFERENT FROM ABOVE	Sounds other than above	Abnormality of signal transmission between indoor unit and outdoor unit ("EE" indicates abnormality of combination).
----	OFF	No sound	No trouble generated in the past.
FFFF	OFF	Triple beep	No corresponding unit.

PCA-RP2GA PCA-RP2.5GA PCA-RP3GA
PCA-RP4GA PCA-RP5GA PCA-RP6GA

SYMBOL	NAME
P.B	INDOOR POWER BOARD
F1	FUSE(4A)
ZNR	VARISTOR
I.B	INDOOR CONTROLLER BOARD
CN2L	CONNECTOR(LOSSNAY)
CN32	CONNECTOR(REMOTE SWITCH)
CN41	CONNECTOR(HA TERMINAL-A)
SW1	JUMPER WIRE(MODEL SELECTION)
SW2	JUMPER WIRE(CAPACITY CORD)
SWE	SWITCH(EMERGENCY OPERATION)
X1	RELAY(DRAIN PUMP)
X4	RELAY(FAN MOTOR)
FC	FAN PHASE CONTROL
LED1	POWER SUPPLY(I.B)
LED2	POWER SUPPLY(R.B)
LED3	TRANSMISSION(INDOOR-OUTDOOR)
C	CAPACITOR(FAN MOTOR)
MF	FAN MOTOR

SYMBOL	NAME
MV	VANE MOTOR
DP	DRAIN-UP MACHINE(OPTION)
DS	DRAIN SENSOR(OPTION)
TB4	TERMINAL BLOCK(INDOOR/OUTDOOR CONNECTING LINE)
TB5	TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)
TH1	ROOM TEMP.THERMISTOR (0℃/15kΩ,25℃/5.4kΩ DETECT)
TH2	PIPE TEMP.THERMISTOR/LIQUID (0℃/15kΩ,25℃/5.4kΩ DETECT)
TH5	COND./EVA.TEMP.THERMISTOR (0℃/15kΩ,25℃/5.4kΩ DETECT)
R.B	REMOTE CONTROLLER BOARD
CN2	CONNECTOR(SCHEDULE TIMER)
TB6	TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)
TB2	TERMINAL BLOCK(HEATER)

SYMBOL	NAME
W.B	WIRELESS REMOTE CONTROLLER BOARD(OPTION)
RU	RECEIVING UNIT
BZ	BUZZER
LED1	LED(RUN INDICATOR)
LED2	LED(HOT ADJUST)
SW1	SWITCH(HEATING ON/OFF)
SW2	SWITCH(COOLING ON/OFF)



[Servicing]
Fasten terminal of the terminal board "TB4" equips lock system.
To remove the fastened terminal,pull it while pressing the protruding portion(locking lever)of the terminal.The fastened terminal protruding portion should face upward.

Please set the voltage using the remote controller.
For the setting method, please refer to the indoor unit Installation Manual.

MODELS	SW1	SW2 Manufacture	SW2 Service board
2GA	<For manufacture> J11 J12 J13 J14 J15	J21 J22 J23 J24	1 2 3 4 ON OFF
2.5GA		J21 J22 J23 J24	1 2 3 4 ON OFF
3GA		J21 J22 J23 J24	1 2 3 4 ON OFF
4GA	<For service board> 1 2 3 4 5 ON OFF	J21 J22 J23 J24	1 2 3 4 ON OFF
5GA		J21 J22 J23 J24	1 2 3 4 ON OFF
6GA		J21 J22 J23 J24	1 2 3 4 ON OFF

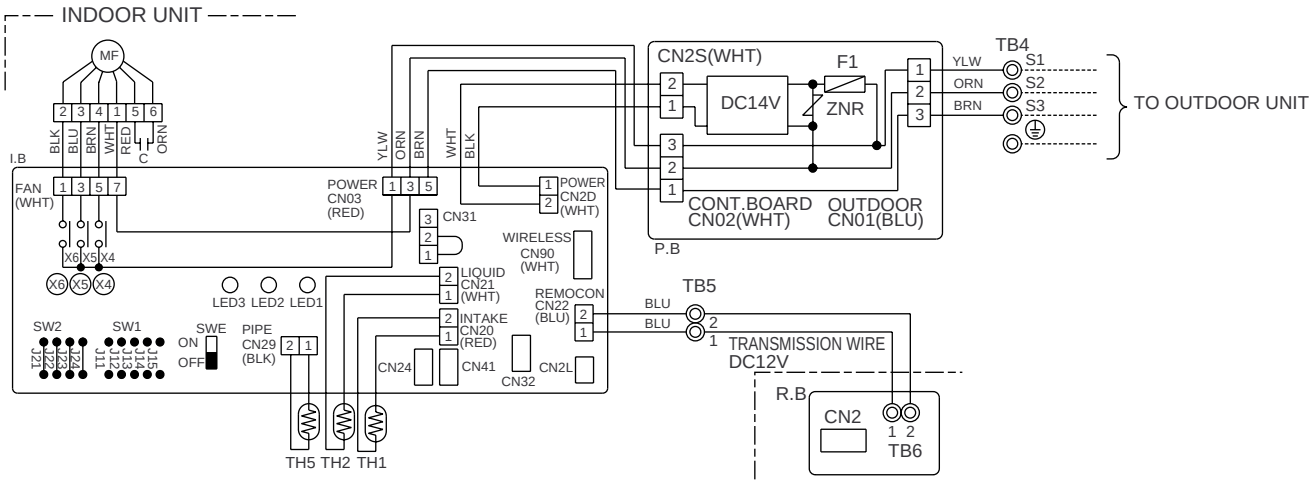
[Self-diagnosis]
1.For details on how to operate self-diagnosis with the wireless remote control,refer to the technical manuals etc.

NOTES:
1.Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2.Indoor and outdoor connecting wires are made with polarities,make wiring matching terminal numbers(S1,S2,S3).
3.Make sure that the main power supply of the booster heater is independent.
4.Symbols used in wiring diagram above are,
□□□ :Connector, ◎ : Terminal (block).

[Emergency operation procedure]
1.When the wired remote control or the indoor unit microcomputer has failed,but all other components work properly, if you set the switch(SWE) on the indoor control panel ON,the indoor unit will begin Emergency Operation.
When Emergency Operation is activated, the indoor unit operates as follows:
(1)Indoor fan is running at high speed.
(2)Drain-up machine(optional) is working.

PEA-RP3EA.TH-A PEA-RP5EA.TH-A
PEA-RP4EA.TH-A PEA-RP6EA.TH-A

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
I.B	INDOOR CONTROLLER BOARD	P.B	INDOOR POWER BOARD	C	CAPACITOR(FAN MOTOR)
CN2L	CONNECTOR(LOSSNAY)	F1	FUSE(4A)	MF	FAN MOTOR
CN32	CONNECTOR(REMOTE SWITCH))	ZNR	VARISTOR	TB4	TERMINAL BLOCK (INDOOR/OUTDOOR CONNECTING LINE)
CN41	CONNECTOR(HA TERMINAL-A)	R.B	REMOTE CONTROLLER BOARD		
LED1	POWER SUPPLY(I.B)	CN2	CONNECTOR(PROGRAM TIMER)		
LED2	POWER SUPPLY(R.B)	TB6	TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSON LINE)		
LED3	TRANSMISSOION(INDOOR • OUTDOOR)				
SW1	JUMPER WIRE(MODEL SELECTION)	TH1	ROOM TEMPERATURE THERMISTOR (0˚C/15kΩ, 25˚C/5.4kΩ DETECT)		
SW2	JUMPER WIRE(CAPACITY CORD)				
SWE	SWITCH(EMERGENCY OPERATION)	TH2	PIPE TEMPERATURE THERMISTOR/LIQUID (0˚C/15kΩ, 25˚C/5.4kΩ DETECT)		
X4	RELAY(FAN MOTOR)				
X5	RELAY(FAN MOTOR)	TH5	COND./EVA. TEMPERATURE THERMISTOR (0˚C/15kΩ, 25˚C/5.4kΩ DETECT)		
X6	RELAY(FAN MOTOR)				

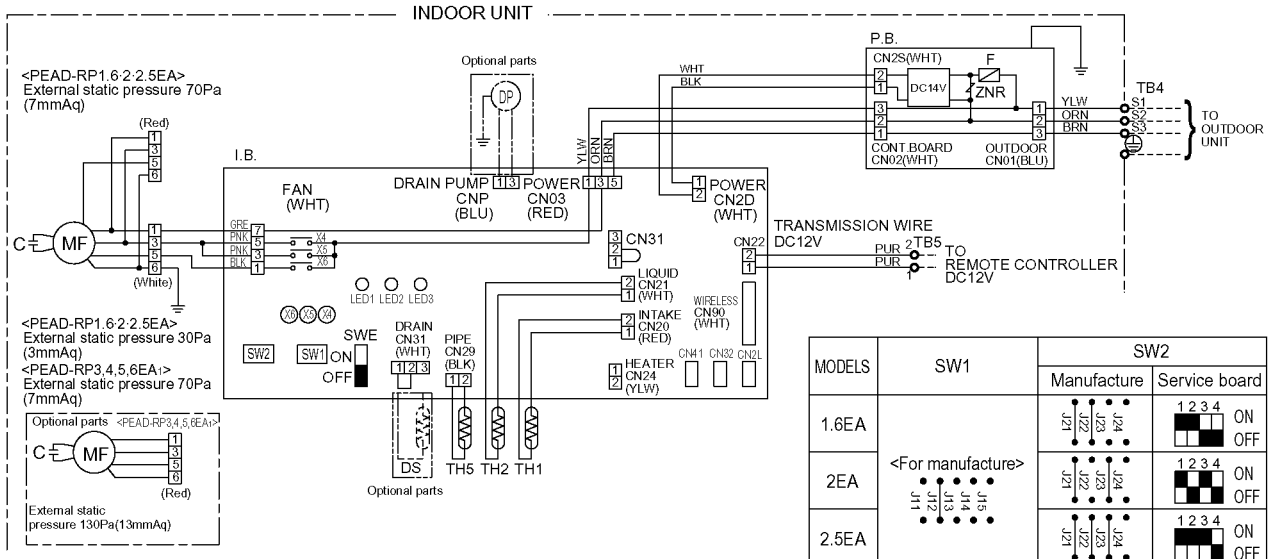


MODELS	SW1	SW2	
		Manufacture	Service board
3EA	<For manufacture>	J21 J22 J23 J24	1 2 3 4 ON OFF
4EA	J11 J12 J13 J14 J15	J21 J22 J23 J24	1 2 3 4 ON OFF
5EA	<For service board>	J21 J22 J23 J24	1 2 3 4 ON OFF
6EA	1 2 3 4 5 ON OFF	J21 J22 J23 J24	1 2 3 4 ON OFF

[NOTES]
1. Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2. Indoor and outdoor connecting wires are made with polarities,make wiring matching terminal numbers(S1,S2,S3).
3. Symbols used in wiring diagram above are, □□□:Connector, ◎:Terminal (block).

[Self diagnosis]
1. When pressing the CHECK switch twice on the remote controller,the unit changes to the self-diagnosis mode and will display the check code by LED(light Emitting Diode)
   Refer to the right table for the check codes and abnormarities.

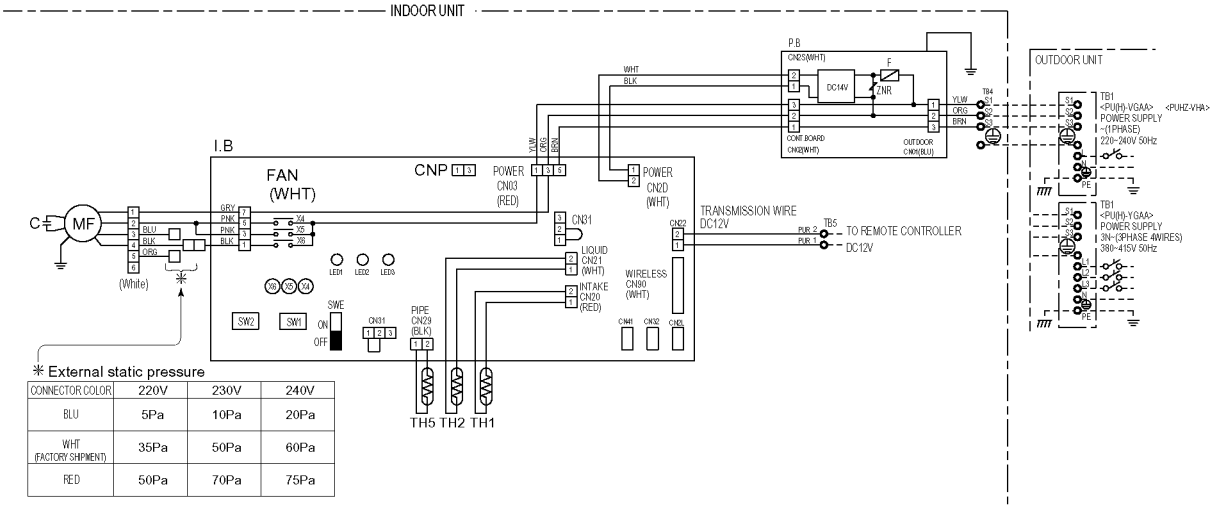
PEAD-RP1.6EA.UK PEAD-RP2EA.UK PEAD-RP2.5EA.UK
PEAD-RP3EA.UK PEAD-RP4EA.UK PEAD-RP5EA.UK PEAD-RP6EA.UK
PEAD-RP3EA$_1$.UK PEAD-RP4EA$_1$.UK PEAD-RP5EA$_1$.UK PEAD-RP6EA$_1$.UK



MODELS	SW1	SW2	
		Manufacture	Service board
1.6EA	<For manufacture> J11 J12 J13 J14 J15 <For service board> 1 2 3 4 5 ON OFF	J21 J22 J23 J24	1 2 3 4 ON OFF
2EA		J21 J22 J23 J24	1 2 3 4 ON OFF
2.5EA		J21 J22 J23 J24	1 2 3 4 ON OFF
3EA		J21 J22 J23 J24	1 2 3 4 ON OFF
4EA		J21 J22 J23 J24	1 2 3 4 ON OFF
5EA		J21 J22 J23 J24	1 2 3 4 ON OFF
6EA		J21 J22 J23 J24	1 2 3 4 ON OFF

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
I.B.	INDOOR CONTROLLER BOARD	P.B.	INDOOR POWER BOARD	C	CAPACITOR(FAN MOTOR)
CN2L	CONNECTOR(LOSSNAY)	F1	FUSE(4A)	MF	FAN MOTOR
CN32	CONNECTOR(REMOTE SWITCH)	ZNR	VARISTOR	TB5	TERMINAL BLOCK(REMOTE CONTROLLER)
CN41	CONNECTOR(HA TERMINAL-A)			TB4	TERMINAL BLOCK (INDOOR/OUTDOOR CONNECTING LINE)
LED1	POWER SUPPLY(I.B.)	DRAIN PUMP	(OPTIONAL PARTS)		
LED2	POWER SUPPLY(REMOTE CONTROLLER)	DP	DRAIN PUMP	TH1	ROOM TEMPERATURE THERMISTOR (0°C/15KΩ, 25°C/5.4KΩ DETECT)
LED3	TRANSMISSION(INDOOR·OUTDOOR)	DS	DRAIN SENSOR		
SW1	JUMPER WIRE(MODEL SELECTION)			TH2	PIPE TEMPERATURE THERMISTOR/LIQUID (0°C/15KΩ, 25°C/5.4KΩ DETECT)
SW2	JUMPER WIRE(CAPACITY CORD)				
SWE	SWITCH(EMERGENCY OPERATION)			TH5	COND./EVA. TEMPERATURE THERMISTOR (0°C/15KΩ, 25°C/5.4KΩ DETECT)
X4	RELAY(FAN MOTOR)				
X5	RELAY(FAN MOTOR)				
X6	RELAY(FAN MOTOR)				

PEAD-RP2.5GA
PEAD-RP3GA
PEAD-RP4GA



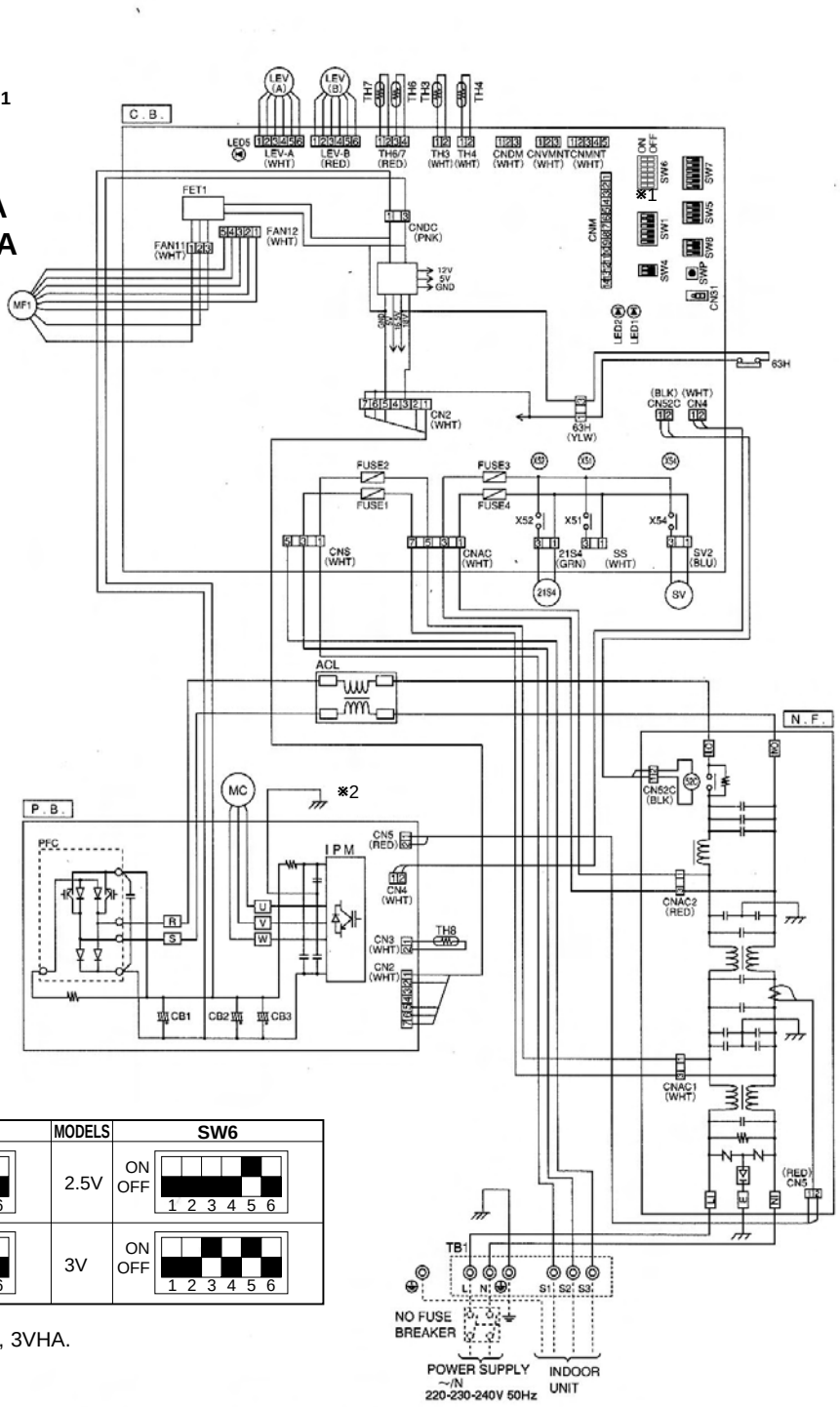
✳ External static pressure

CONNECTOR COLOR	220V	230V	240V
BLU	5Pa	10Pa	20Pa
WHT (FACTORY SHIPMENT)	35Pa	50Pa	60Pa
RED	50Pa	70Pa	75Pa

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
I.B	INDOOR CONTROLLER BOARD	P.B	INDOOR POWER BOARD	C	CAPACITOR(FAN MOTOR)
CN2L	CONNECTOR(LOSSNAY)	F1	FUSE(4A)	MF	FAN MOTOR
CN32	CONNECTOR(REMOTE SWITCH)	ZNR	VARISTOR	TB5	TERMINAL BLOCK(REMOTE CONTROLLER)
CN41	CONNECTOR(HA TERMINAL-A)			TB4	TERMINAL BLOCK (INDOOR/OUTDOOR CONNECTING LINE)
LED1	POWER SUPPLY(I.B)				
LED2	POWER SUPPLY(REMOTE CONTROLLER)			TH1	ROOM TEMPERATURE THERMISTOR (0°C/15KΩ,25°C/5.4KΩ DETECT)
LED3	TRANSMISSION(INDOOR-OUTDOOR)				
SW1	JUMPER WIRE(MODEL SELECTION)			TH2	PIPE TEMPERATURE THERMISTOR/LIQUID (0°C/15KΩ,25°C/5.4KΩ DETECT)
SW2	JUMPER WIRE(CAPACITY CORD)				
SWE	SWITCH(EMERGENCY OPERATION)			TH5	COND./EVA. TEMPERATURE THERMISTOR (0°C/15KΩ,25°C/5.4KΩ DETECT)
X4	RELAY(FAN MOTOR)				
X5	RELAY(FAN MOTOR)				
X6	RELAY(FAN MOTOR)				

MODELS	SW1	SW2	
		Manufacture	Service board
2.5GA	<For manufacture> 1#1 2#1 3#1 4#1 <For service board> 1 2 3 4 5 ON OFF	1 2 3 4 ON OFF	1 2 3 4 ON OFF
3GA		1 2 3 4 ON OFF	1 2 3 4 ON OFF
4GA		1 2 3 4 ON OFF	1 2 3 4 ON OFF

PUHZ-RP1.6VHA
PUHZ-RP2VHA
PUHZ-RP2.5VHA
PUHZ-RP2.5VHA$_1$
PUHZ-RP3VHA
PUHZ-RP3VHA$_1$
PUHZ-RP3VHA-A
PUHZ-RP3VHA$_1$-A



※1 MODEL SELECT

MODELS	SW6	MODELS	SW6
1.6V	ON / OFF 1 2 3 4 5 6	2.5V	ON / OFF 1 2 3 4 5 6
2V	ON / OFF 1 2 3 4 5 6	3V	ON / OFF 1 2 3 4 5 6

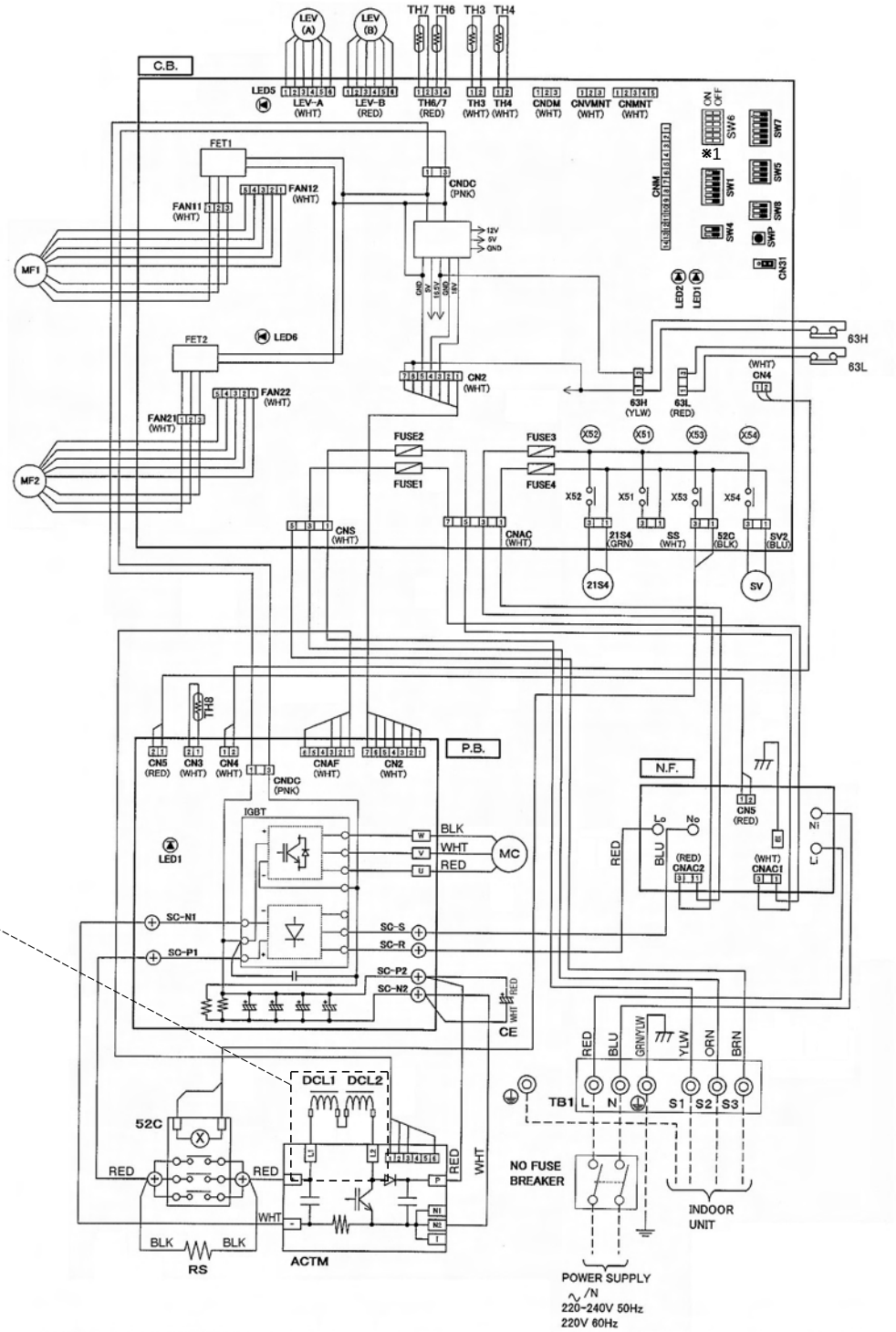
※2 Only PUHZ-RP2.5, 3VHA.

SYMBOL	NAME
TB1	Terminal Block (Power Supply, Indoor/Outdoor)
MC	Motor for Compressor
MF1	Fan Motors
21S4	Solenoid Valve (Four-Way Valve)
63H	High Pressure Switch
SV	Solenoid Valve (Bypass Valve)
TH3	Thermistor (Outdoor Pipe)
TH4	Thermistor (Discharge)
TH6	Thermistor (Outdoor 2-Phase Pipe)
TH7	Thermistor (Outdoor)
TH8	Thermistor (Heat sink)
LEV(A),LEV(B)	Linear Expansion Valve
ACL	Reactors
P.B.	Power Circuit Board
R/S	Connection Terminal (L/N-Phase)
U/V/W	Connection Terminal (U/V/W-Phase)
CN2~5	Connector
PFC	Converter
IPM	Inverter
CB1~CB3	Main Smoothing Capacitor

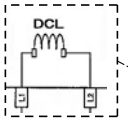
SYMBOL	NAME
N.F.	Noise Filter Circuit Board
L/LO	Connection Terminal (L-Phase)
N/NO	Connection Terminal (N-Phase)
E	Connection Terminal (Ground)
CNAC1/2	Connector
CN5	Connector
CN52C	Connector
52C	52C Relay
C.B.	Controller Circuit Board
SW1	Switch (Forced Defrost, Defect History Record Reset, Refrigerant Address)
SW4	Switch (Test Operation)
SW5	Switch (Function Switch)
SW6	Switch (Model Select)
SW7	Switch (Function Setup)
SW8	Switch
LED1,LED2	Light Emitting Diodes (Operation Inspection Indicators)
LED5	Light Emitting Diodes (MF1 Operation Status Indicators)

SYMBOL	NAME
FUSE1~4	Fuse (6.3 A)
SWP	Switch (Pump Down)
CN31	Connector (Emergency Operation)
CNAC	Connector
CNDC	Connector
CNS	Connector
FAN11	Connector
FAN12	Connector
SS	Connector (Connection for Option)
SV2	Connector
CNM	Connector (A-Control Service Inspection Kit)
CNMNT	Connector (Connected to Optional M-NET Adapter Board)
CNVMNT	Connector (Connected to Optional M-NET Adapter Board)
CNDM	Connector (Connected for Option (Contact Input))
X51,X52,X54	Reray
FET1	MF1 Drive Element

PUHZ-RP4VHA
PUHZ-RP5VHA
PUHZ-RP6VHA
PUHZ-RP4VHA$_1$
PUHZ-RP5VHA$_1$
PUHZ-RP6VHA$_1$
PUHZ-RP4VHA-A
PUHZ-RP5VHA-A
PUHZ-RP6VHA-A
PUHZ-RP4VHA$_1$-A
PUHZ-RP5VHA$_1$-A
PUHZ-RP6VHA$_1$-A



Only PUHZ-RP4VHA$_1$
PUHZ-RP5VHA$_1$
PUHZ-RP6VHA$_1$



※1 MODEL SELECT

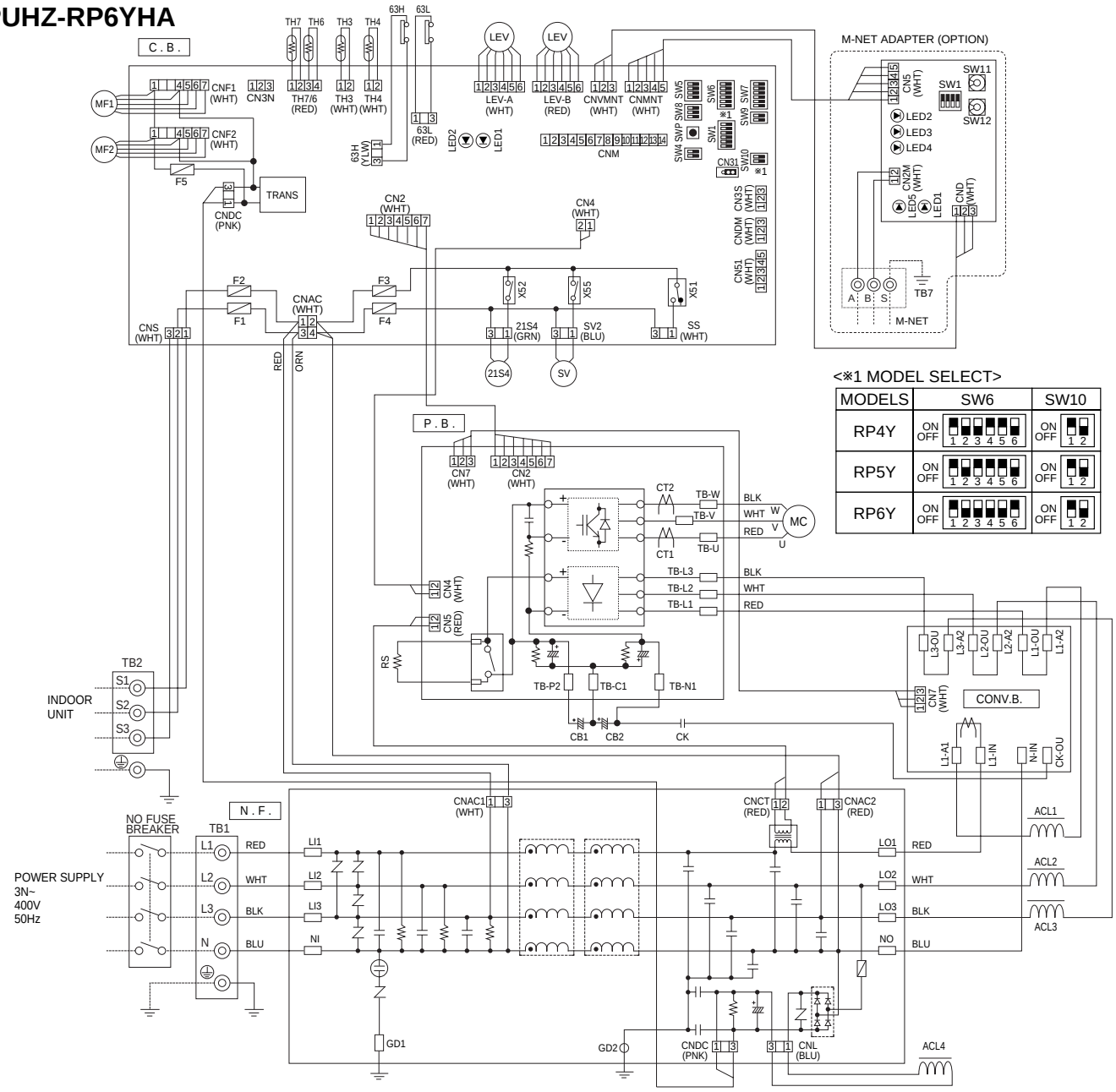
MODELS	SW6
4V	ON / OFF — 1 2 3 4 5 6
5V	ON / OFF — 1 2 3 4 5 6
6V	ON / OFF — 1 2 3 4 5 6

SYMBOL	NAME
TB1	Terminal Block (Power Supply, Indoor/Outdoor)
MC	Motor for Compressor
MF1,MF2	Fan Motors
21S4	Solenoid Valve (Four-Way Valve)
SV	Solenoid Valve (Bypass Valve)
63H	High Pressure Switch
63L	Low Pressure Switch
TH3	Thermistor (Outdoor Pipe)
TH4	Thermistor (Discharge)
TH6	Thermistor (Outdoor 2-Phase Pipe)
TH7	Thermistor (Outdoor)
TH8	Thermistor (Heat sink)
LEV(A),LEV(B)	Linear Expansion Valve
DCL1, DCL2	Reactors (RP4-6VHA)
DCL	Reactor (RP4-6VHA$_1$)
52C	52C Relay
RS	Rush Current Protect Resistor
ACTM	Active Filter Module
CE	Main Smoothing Capacitor
P.B.	Power Circuit Board
U/V/W	Connection Terminal (U/V/W-Phase)

SYMBOL	NAME
SC-R/S	Screw Type Terminal (L/N-Phase)
SC-P1, P2	Screw Type Terminal (DC Voltage)
SC-N1, N2	Screw Type Terminal (DC Voltage)
CN2~5	Connector
CNDC	Connector
CNAF	Connector
IGBT	Converter, Inverter
LED1	Light Emitting Diodes (Inverter Control Status)
N.F.	Noise Filter Circuit Board
LI/LO	Connection Lead (L-Phase)
NI/NO	Connection Lead (N-Phase)
EI	Connection Terminal (Ground)
CNAC1/2	Connector
CN5	Connector
C.B.	Controller Circuit Board
FUSE1~4	Fuse (6.3 A)
SW1	Switch (Forced Defrost, Defect History Record Reset, Refrigerant Address)
SW4	Switch (Test Operation)
SW5	Switch (Function Switch)
SW6	Switch (Model Select)

SYMBOL	NAME
SW7	Switch (Function Setup)
SW8	Switch
SWP	Switch (Pump Down)
CN31	Connector (Emergency Operation)
LED1,LED2	Light Emitting Diodes (Operation Inspection Indicators)
LED5/6	Light Emitting Diodes (MF1/MF2 Operation Status Indicators)
CNAC	Connector
CNDC	Connector
CNS	Connector
FAN11	Connector
FAN12	Connector
FAN21	Connector
FAN22	Connector
SS	Connector (Connection for Option)
SV2	Connector
CNM	Connector (A-Control Service Inspection Kit)
CNMNT	Connector (Connected to Optional M-NET Adapter Board)
CNVMNT	Connector (Connected to Optional M-NET Adapter Board)
CNDM	Connector (Connected for Option (Contact Input))

PUHZ-RP4YHA
PUHZ-RP5YHA
PUHZ-RP6YHA



<※1 MODEL SELECT>

MODELS	SW6	SW10
RP4Y	ON OFF 1 2 3 4 5 6	ON OFF 1 2
RP5Y	ON OFF 1 2 3 4 5 6	ON OFF 1 2
RP6Y	ON OFF 1 2 3 4 5 6	ON OFF 1 2

SYMBOL	NAME
TB1	Terminal Block <Power Supply >
TB2	Terminal Block <Indoor/Outdoor >
MC	Motor for Compressor
MF1,MF2	Fan Motor
21S4	Solenoid Valve (Four-Way Valve)
SV	Solenoid Valve (Bypass Valve)
63H	High Pressure Switch
63L	Low Pressure Switch
TH3	Thermistor <Outdoor Pipe>
TH4	Thermistor <Discharge>
TH6	Thermistor <Outdoor 2-Phase Pipe>
TH7	Thermistor <Outdoor>
LEV	Linear Expansion Valve
ACL1~ACL4	Reactor
CB1,CB2	Main Smoothing Capacitor
CK	Capacitor
RS	Rush Current Protect Resistor
P.B.	Power Circuit Board
TB-U/V/W	Connection Terminal <U/V/W-Phase>
TB-L1/L2/L3	Connection Terminal <L1/L2/L3-Power Supply>
TB-P2	Connection Terminal
TB-C1	Connection Terminal
TB-N1	Connection Terminal
CT1, CT2	Current Trans
CN2	Connector
CN4	Connector
CN5	Connector
CN7	Connector

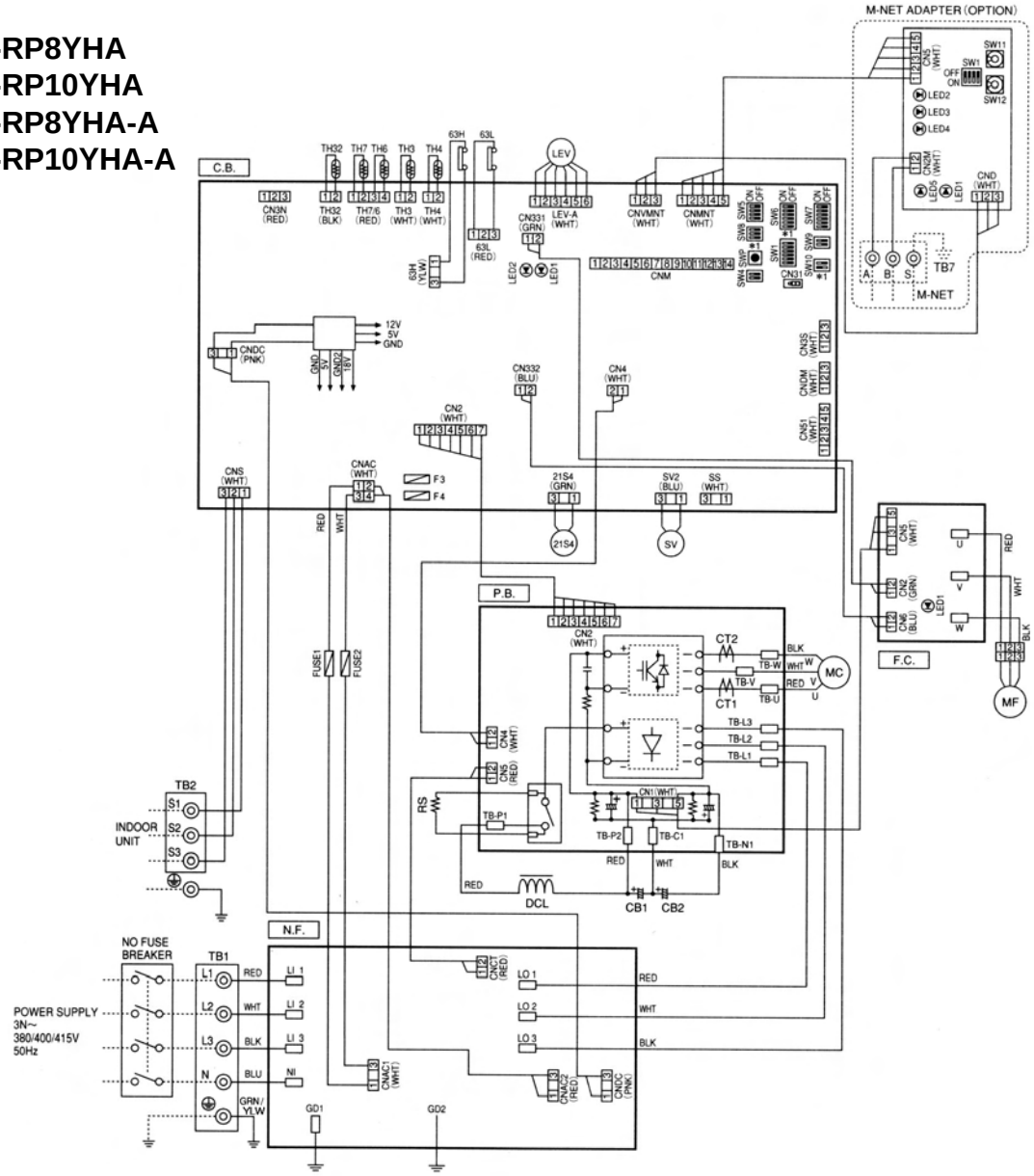
SYMBOL	NAME
N.F.	Noise Filter Circuit Board
L1/L2/L3/NI	Connection Terminal <L1/L2/L3/N-Power Supply>
L01/L02/L03/NO	Connection Terminal <L1/L2/L3/N-Power Supply>
CNAC1	Connector
CNAC2	Connector
CNCT	Connector
CNDC	Connector
CNL	Connector
GD1	Connection Terminal <Ground>
CONV.B	Converter Circuit Board
L1-A1/IN	Connection Terminal <L1-Power Supply>
L1-A2/OU	Connection Terminal <L1-Power Supply>
L2-A2/OU	Connection Terminal <L2-Power Supply>
L3-A2/OU	Connection Terminal <L3-Power Supply>
N-IN	Connector
CK-OU	Connector
CN7	Connector
C.B.	Controller Circuit Board
F1,F2	FUSE <6.3 A>
F3,F4	FUSE <6.3 A>
SW1	Switch <Forced Defrost, Defect History Record Reset, Refrigerant Adress>
SW4	Switch <Test Operation>
SW5	Switch <Function Switch>
SW6	Switch <Model Select>
SW7	Switch <Function Switch>
SW8	Switch <Function Switch>
SW9	Switch <Function Switch>

SYMBOL	NAME
SW10	Switch <Model Select>
SWP	Switch <Pump Down>
CN31	Connector <Emergency Operation>
CNAC	Connector
CNS	Connector
CNDC	Connector
21S4	Connector <Four-Way Valve>
SV2	Connector <Bypass Valve>
SS	Connector <Connection for Option>
CN2	Connector
CN4	Connector
LEV-A/LEV-B	Connector <LEV>
63H	Connector <High Pressure Switch>
63L	Connector <Low Pressure Switch>
TH3	Connector <Thermistor>
TH4	Connector <Thermistor>
TH7/6	Connector <Thermistor>
CNF1/CNF2	Connector <Fan Motor Operation>
LED1/LED2	LED <Operatiion Inspection Indicators>
CNM	Connector <A-Control Service Inspection Kit>
CNVMNT	Connector <Connect to Optional M-NET Adapter Board>
CNMNT	Connector <Connect to Optional M-NET Adapter Board>
CN3S	Connector < Connection for Option>
CNDM	Connector < Connection for Option>
CN51	Connector < Connection for Option>

M-NET ADAPTER

TB7	Terminal Block <M-NET connection >	SW12	Switch <Address setting. 2nd digit >
CN5	Connector <Transmission>	LED1	LED <Power Supply: DC5V>
CND	Connector <Power Supply>	LED2	LED <Connection to Outdoor Unit>
CN2M	Connector <M-NET communication>	LED3	LED <Transmission: Sending>
SW1	Switch <Status of communication>	LED4	LED <Transmission: Receiving>
SW11	Switch <Address setting: 1st digit>	LED5	LED <Power Supply: DC12V>

PUHZ-RP8YHA
PUHZ-RP10YHA
PUHZ-RP8YHA-A
PUHZ-RP10YHA-A



SYMBOL	NAME
TB1	Terminal Block 〈Power Supply〉
TB2	Terminal Block 〈Indoor/Outdoor〉
MC	Motor Compressor
MF	Fan Motor
21S4	Solenoid Valve 〈Four-Way Valve〉
SV	Solenoid Valve 〈Bypass Valve〉
63H	High Pressure Switch
63L	Low Pressure Switch
TH3	Thermistor 〈Outdoor Pipe〉
TH32	Thermistor 〈Outdoor Pipe〉
TH4	Thermistor 〈Discharge〉
TH6	Thermistor 〈Outdoor 2-Phase Pipe〉
TH7	Thermistor 〈Outdoor〉
LEV	Linear Expansion Valve
DCL	Reactor
CB1,CB2	Main Smoothing Capacitor
RS	Rush Current Protect Resistor
FUSE1,FUSE2	FUSE 〈15 A〉
P.B.	Power Circuit Board
TB-U/V/W	Connection Terminal 〈U/V/W-Phase〉
TB-L1/L2/L3	Connection Terminal 〈L1/L2/L3-Power Supply〉
TB-P1	Connection Terminal
TB-P2	Connection Terminal
TB-C1	Connection Terminal
TB-N1	Connection Terminal
CT1,CT2	Current Trans
CN1	Connector
CN2	Connector
CN4	Connector
CN5	Connector
N.F.	Noise Filter Circuit Board
LI1/LI2/LI3/NI	Connection Terminal 〈L1/L2/L3/N-Power Supply〉
LO1/LO2/LO3/NO	Connection Terminal 〈L1/L2/L3/N-Power Supply〉
CNAC1	Connector
CNAC2	Connector
CNCT	Connector
CNDC	Connector
F.C.	Fan Controller Circuit Board
U/V/W	Connection Terminal 〈U/V/W-Phase〉
CN2	Connector
CN5	Connector
CN6	Connector
LED1	LED 〈MF Operation Status Indicators〉

SYMBOL	NAME
C.B.	Controller Circuit Board
F3,F4	FUSE 〈6.3 A〉
SW1	Switch 〈Forced Defrost, Defect History Record Reset, Refrigerant Address〉
SW4	Switch 〈Test Operation〉
SW5	Switch 〈Function Switch〉
SW6	Switch 〈Model Select〉
SW7	Switch 〈Function Switch〉
SW8	Switch 〈Function Switch〉
SW9	Switch 〈Function Switch〉
SW10	Switch 〈Function Switch〉
SWP	Switch 〈Pump Down〉
CN31	Connector 〈Emergency Operation〉
CNAC	Connector
CNS	Connector
CNDC	Connector
21S4	Connector
SV2	Connector
SS	Connector 〈Connection for Option〉
CN2	Connector
CN4	Connector
CN331	Connector
CN332	Connector
LEV-A	Connector
63H	Connector
63L	Connector
TH3	Connector
TH4	Connector
TH7/6	Connector
TH32	Connector
CNM	Connector 〈A-Control Service Inspection Kit〉
CNVMNT	Connector 〈Connect to Optional M-NET Adapter Board〉
CNMNT	Connector 〈Connect to Optional M-NET Adapter Board〉
CN3S	Connector 〈Connection for Option〉
CNDM	Connector 〈Connection for Option〉
CN51	Connector 〈Connection for Option〉
LED1,LED2	LED 〈Operation Inspection Indicators〉

＊1 MODEL SELECT

MODEL	SW6	SW8	SW10
RP8Y	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3	ON OFF 1 2
RP10Y	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3	ON OFF 1 2

M-NET ADAPTER

SYMBOL	NAME
TB7	Terminal Block 〈M-NET connection〉
CN5	Connector 〈Transmission〉
CND	Connector 〈Power Supply〉
CN2M	Connector 〈M-NET communication〉
SW1	Switch 〈Status of communication〉
SW11	Switch 〈Address setting:1st digit〉
SW12	Switch 〈Address setting:2nd digit〉
LED1	LED 〈Power Supply:DC5V〉
LED2	LED 〈Connection to Outdoor Unit〉
LED3	LED 〈Transmission:Sending〉
LED4	LED 〈Transmission:Receiving〉
LED5	LED 〈Power Supply:DC12V〉

4 REFRIGERANT SYSTEM DIAGRAM

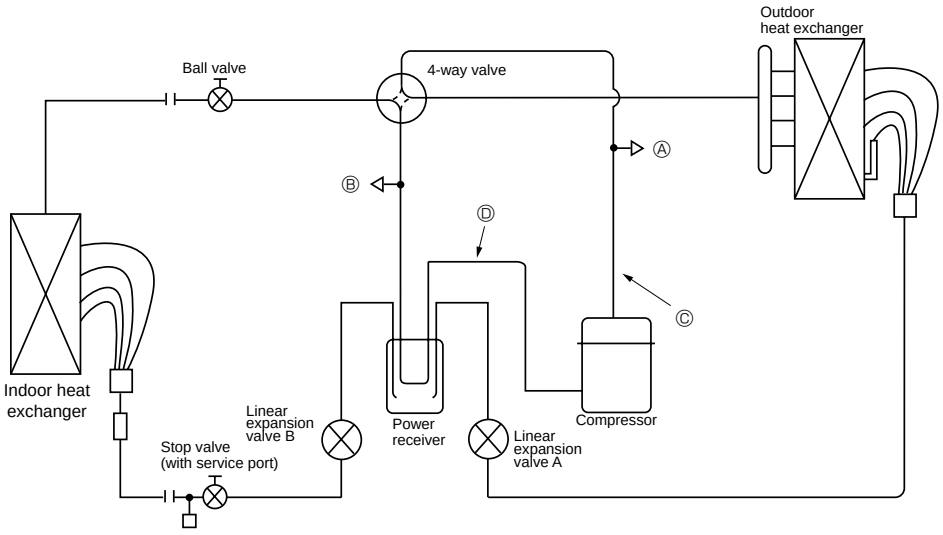
4-1. CHECKING OPERATION STATUSES PUHZ-RP • HA

4-1-1. Measurement points and items

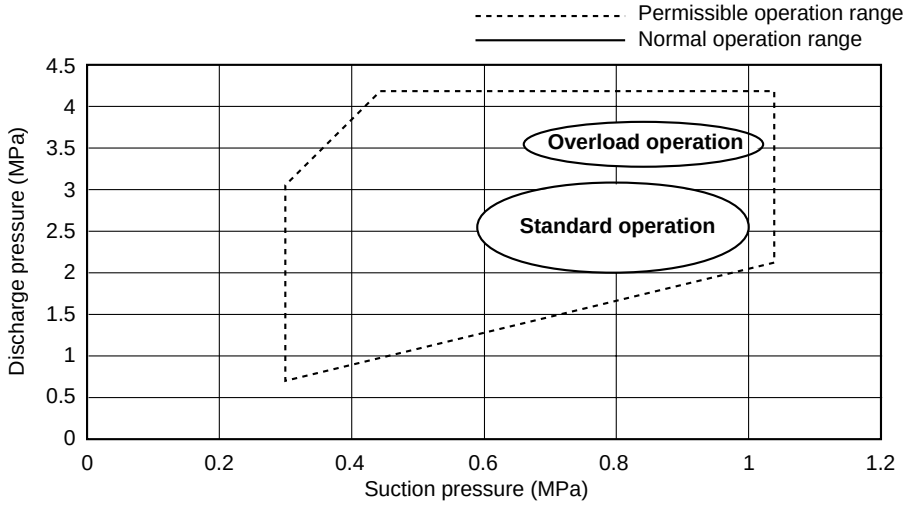
•The table and diagrams below show the measurement item for each measurement point, and the pressure and temperature near the ISO T1 standard operating conditions.
•Measure the temperature and pressure of each part by following the descriptions in the table.
•Measurement time: Be sure to wait until the refrigerant circuit has stabilized (30 minutes to 1 hour) before taking measurements.

	Measurement item	Pressure/temperature near JIS standard operating conditions	Measurement method, remarks
Ⓐ	High pressure (MPa)	COOL: 2.3 ~ 3.0 HEAT: 2.0 ~ 3.2	Connect the pressure gauge to the high-pressure check valve.
Ⓑ	Low pressure (MPa)	0.55 ~ 1.0	Connect the pressure gauge to the low-pressure check valve.
Ⓒ	Discharge pipe temperature (℃)	50 ~ 100	Measured with piping surface thermometer.
Ⓓ	Suction pipe temperature (℃)	-2 ~ +18	Measured with piping surface thermometer.
Ⓔ	Indoor intake temperature (℃)	COOL: 27℃ HEAT: 20℃	Can be displayed on remote controller.
Ⓕ	Indoor outlet temperature (℃)	COOL: 8 ~ 20 HEAT: 30 ~ 50	Measured with thermometer.
Ⓖ	Outdoor intake temperature (℃)	COOL: 35 HEAT: 7	Measured with thermometer.
Ⓗ	Outdoor outlet temperature (℃)	COOL: 40 ~ 50 HEAT: 0 ~ 5	Measured with thermometer.

Notes : The operation statuses vary depending on the compressor's operating frequency because units are inverter-type.

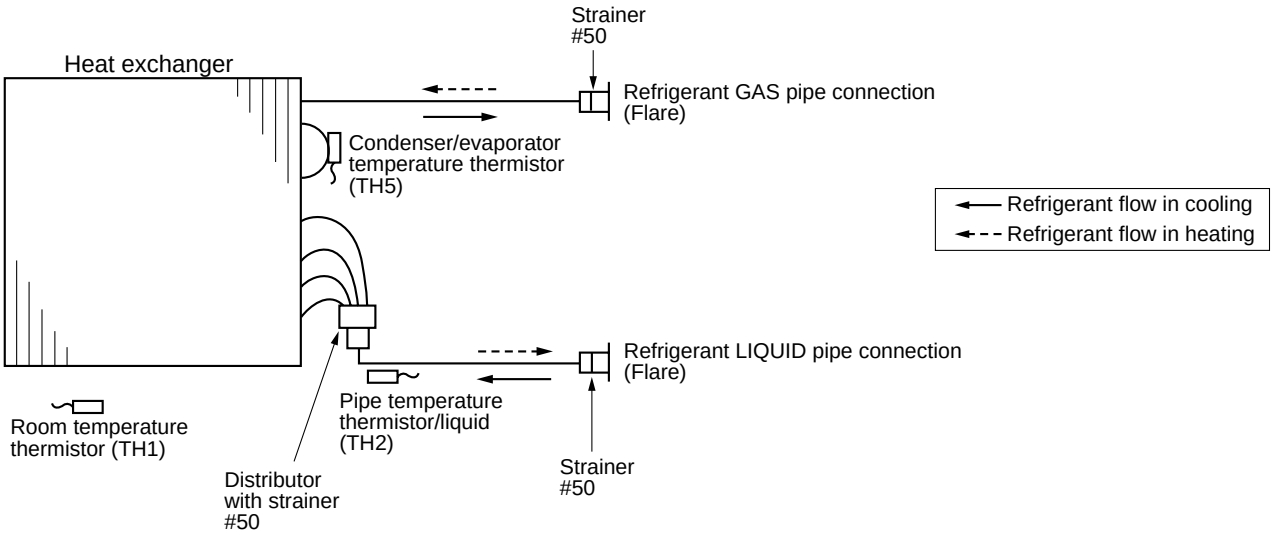


4-1-2. Operation pressure ranges

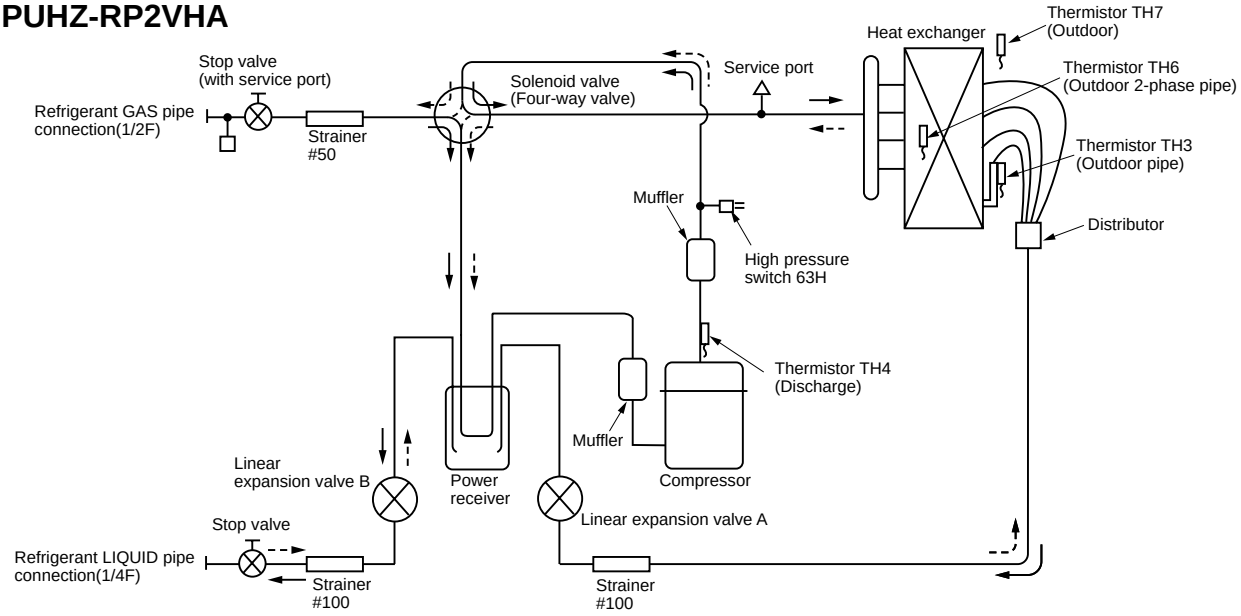


4-2. REFRIGERANT SYSTEM DIAGRAM

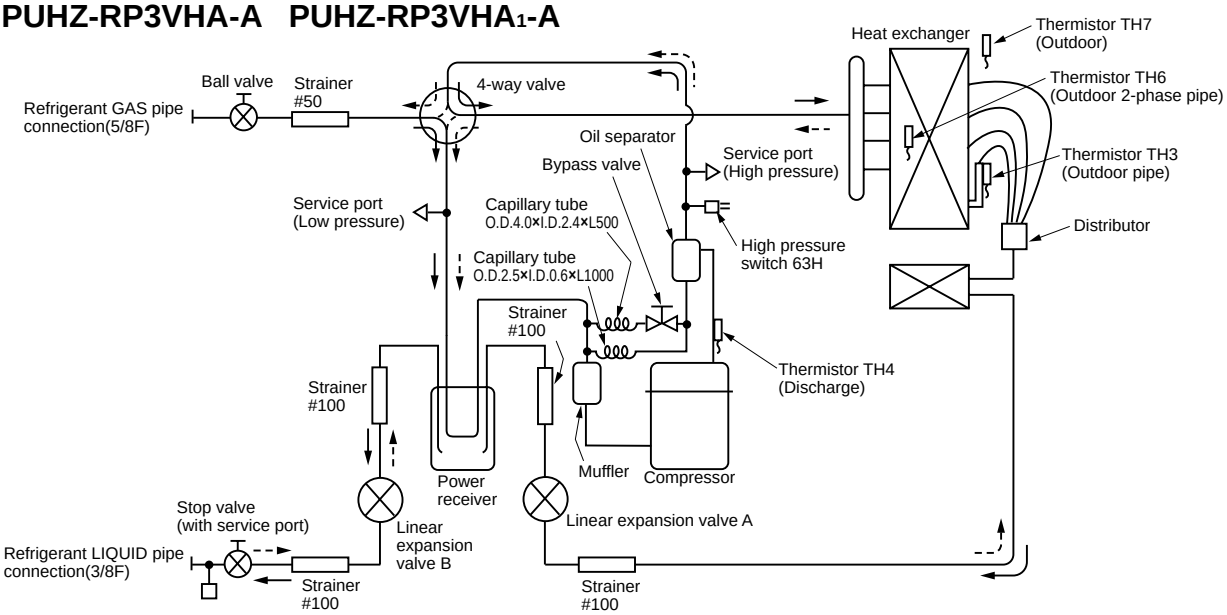
PLA-RP1.6AA	**PLA-RP2AA**	**PLA-RP2.5AA**	
PLA-RP1.6AA.UK	**PLA-RP2AA.UK**	**PLA-RP2.5AA.UK**	
PLA-RP3AA	**PLA-RP4AA**	**PLA-RP5AA**	**PLA-RP6AA**
PLA-RP3AA.UK	**PLA-RP4AA.UK**	**PLA-RP5AA.UK**	**PLA-RP6AA.UK**
PLA-RP3AA$_1$	**PLA-RP4AA$_1$**	**PLA-RP5AA$_1$**	**PLA-RP6AA$_1$**
PLA-RP3AA$_1$.UK	**PLA-RP4AA$_1$.UK**	**PLA-RP5AA$_1$.UK**	**PLA-RP6AA$_1$.UK**
PKA-RP1.6GAL	**PKA-RP2GAL**		
PKA-RP2.5FAL	**PKA-RP3FAL**	**PKA-RP4FAL**	
PCA-RP2GA	**PCA-RP2.5GA**		
PCA-RP3GA	**PCA-RP4GA**	**PCA-RP5GA**	**PCA-RP6GA**
PEA-RP3EA.TH-A	**PEA-RP4EA.TH-A**	**PEA-RP5EA.TH-A**	**PEA-RP6EA.TH-A**
PEAD-RP1.6EA.UK	**PEAD-RP2EA.UK**	**PEAD-RP2.5EA.UK**	
PEAD-RP3EA.UK	**PEAD-RP4EA.UK**	**PEAD-RP5EA.UK**	**PEAD-RP6EA.UK**
PEAD-RP3EA$_1$.UK	**PEAD-RP4EA$_1$.UK**	**PEAD-RP5EA$_1$.UK**	**PEAD-RP6EA$_1$.UK**
PEAD-RP2.5GA.UK	**PEAD-RP3GA.UK**	**PEAD-RP4GA.UK**	



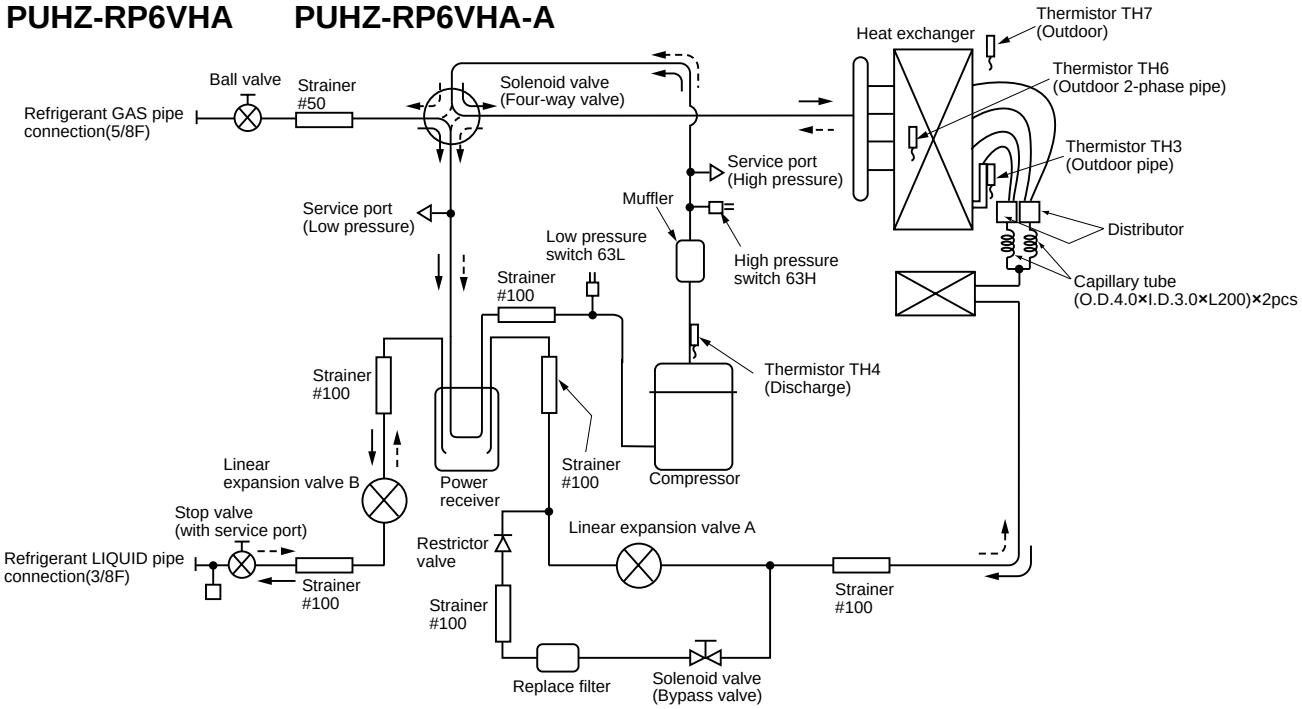
PUHZ-RP1.6VHA
PUHZ-RP2VHA



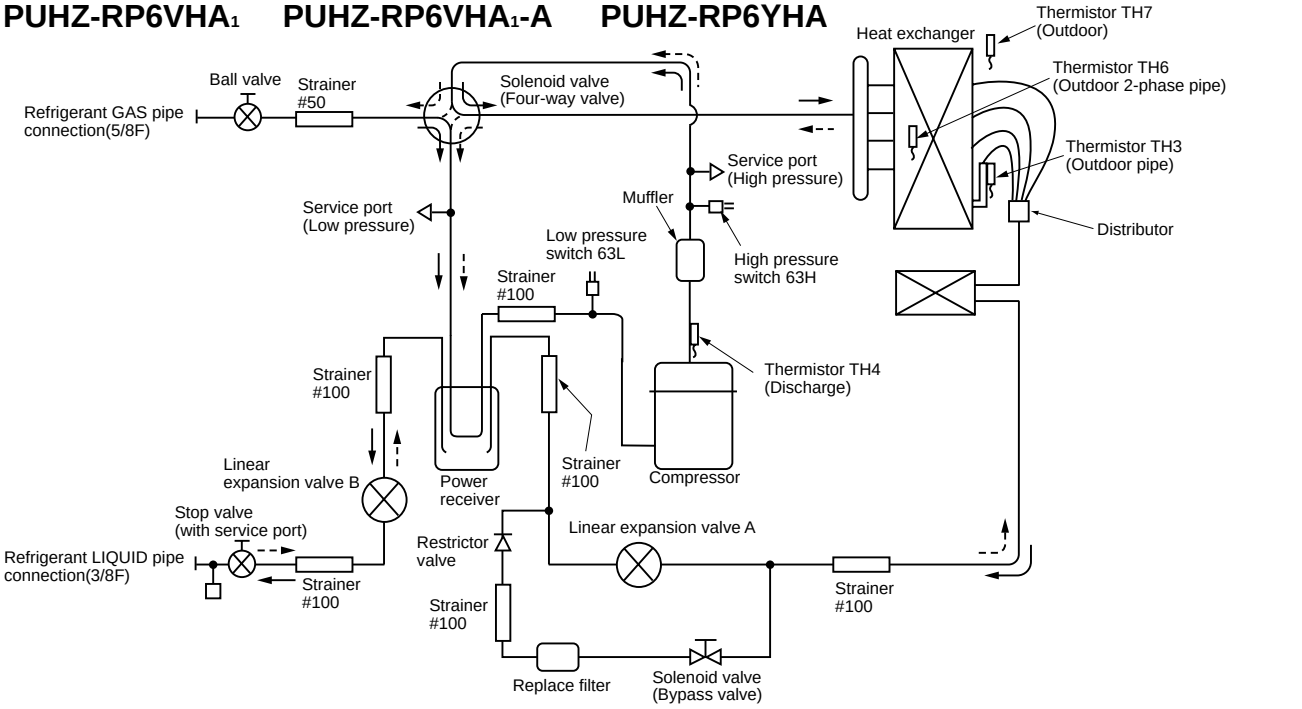
PUHZ-RP2.5VHA PUHZ-RP2.5VHA$_1$
PUHZ-RP3VHA PUHZ-RP3VHA$_1$
PUHZ-RP3VHA-A PUHZ-RP3VHA$_1$-A



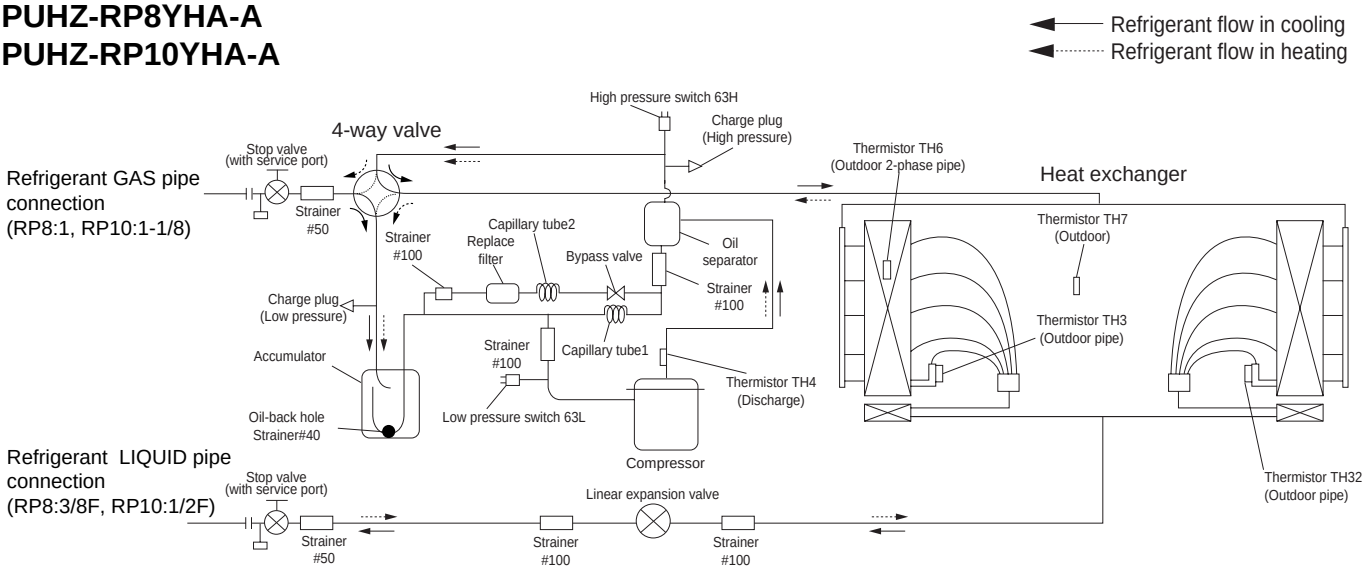
PUHZ-RP4VHA PUHZ-RP4VHA-A
PUHZ-RP5VHA PUHZ-RP5VHA-A
PUHZ-RP6VHA PUHZ-RP6VHA-A



PUHZ-RP4VHA$_1$ PUHZ-RP4VHA$_1$-A PUHZ-RP4YHA
PUHZ-RP5VHA$_1$ PUHZ-RP5VHA$_1$-A PUHZ-RP5YHA
PUHZ-RP6VHA$_1$ PUHZ-RP6VHA$_1$-A PUHZ-RP6YHA



PUHZ-RP8YHA
PUHZ-RP10YHA
PUHZ-RP8YHA-A
PUHZ-RP10YHA-A



4-3. APPLICABLE EXTENSION PIPE FOR EACH MODEL
PUHZ-RP•VHA(-A), PUHZ-RP4~6YHA

The height difference between indoor and outdoor unit should be kept within 30 m for all models.

4-3-1. 1:1 system

(a) Maximum pipe length

<Table 1> Pipe length for 1:1 system

Liquid pipe (mm)	OD	ϕ6.35			ϕ9.52			ϕ12.7	
	Thick-ness	t0.8			t0.8			t0.8	
Gas pipe (mm)	OD	ϕ9.52	ϕ12.7	ϕ15.88	ϕ12.7	ϕ15.88	ϕ19.05	ϕ15.88	ϕ19.05
	Thick-ness	t0.8	t0.8	t1.0	t0.8	t1.0	t1.0	t1.0	t1.0
RP1.6		□30m	◎50m	○30m	△30m	△30m (*1)	×	×	×
RP2		□10m	◎50m	○30m	△30m	△30m (*1)	×	×	×
RP2.5		×	□10m	○10m	□30m	◎50m	×	△30m	×
RP3		×	□10m	○10m	□30m	◎50m	×	△30m	×
RP4		×	×	×	×	◎75m (*2)	○50m (*1)	△50m	△50m (*1)
RP5		×	×	×	×	◎75m (*2)	○50m (*1)	△50m	△50m (*1)
RP6		×	×	×	×	◎75m (*2)	○50m (*1)	△50m	△50m (*1)

*1: Set DIP SW8-1 on outdoor unit controller board to ON.
*2: The maximum length is 50 m in case of using existing pipes.

[Marks in the table above]

◎ : Standard piping
△ : It can be used, however, additional refrigerant charge is required when the pipe length exceeds 20m. ➡ Refer to <table 4>.
× : It cannot be used.
○ : It can be used.
□ : It can be used, however, the capacity is lowered. ➡ Refer to (c) **Capacity correction.**

(b) Adjusting the amount of refrigerant

- Additional refrigerant charge is not necessary for the pipe length up to 30 m. When the pipe length exceeds 30 m or service (refrigerant replacement) is performed, charge proper amount of refrigerant for each pipe length referring to table below. Use refrigerant R410A. Use charge hose exclusive for R410A.
- When charging additional refrigerant, charge the refrigerant from low-pressure side of the port valve using a safety charger.
- Make sure that air purge for this unit at refrigerant replacement is performed from both high-pressure check valve and service port. If air purge is performed only from one of them, air in not purged enough.
- When replacing refrigerant, charge the refrigerant from service port. When charged refrigerant is less than specified amount, charge the refrigerant again from low pressure side of the port valve using a safety charger.
- Tighten the service port cap (nut) of stop valve firmly. The tightening torque is 12 to 16 N·m. (to prevent slow-leak)
- Check additional refrigerant charging amount referring to table 4 when liquid pipe is one size larger than standard diameter, and table 2 when the pipe is standard diameter.

<Table 2> Additional refrigerant charging amount for pipe of standard diameter

Outdoor unit	Permitted pipe length	Additional refrigerant charging amount for pipe length exceeding 30 m (kg)				Number of bends	Height difference
		31 — 40m	41 — 50m	51 — 60m	61 — 75m		
PUHZ-RP1.6, 2VHA	50m or less	0.2kg	0.4kg	—	—	15	30m or above
PUHZ-RP2.5, 3VHA, 2.5, 3VHA1	50m or less	0.6Kg	1.2Kg	—	—		
PUHZ-RP4-6VHA, RP4-6VHA1, RP4-6YHA	75m or less	0.6kg	1.2kg	1.8kg	2.4kg		

<Table 3>

Outdoor unit	Permitted pipe length	Recharge refrigerant amount or additional amount in parentheses						
		10m or below	11 — 20m	21 — 30m	31 — 40m	41 — 50m	51 — 60m	61 — 75m
PUHZ-RP1.6, 2VHA	50m or less	2.1	2.3	2.5	2.7 (0.2)	2.9 (0.4)	— —	— —
PUHZ-RP2.5, 3VHA PUHZ-RP2.5, 3VHA1	50m or less	3.1	3.3	3.5	4.1 (0.6)	4.7 (1.2)	— —	— —
PUHZ-RP4-6VHA	75m or less	5.1	5.3	5.5	6.1 (0.6)	6.7 (1.2)	7.3 (1.8)	7.9 (2.4)
PUHZ-RP4-6VHA1 PUHZ-RP4-6YHA	75m or less	4.6	4.8	5.0	5.6 (0.6)	6.2 (1.2)	6.8 (1.8)	7.4 (2.4)

<Table 4> Required additional charge when the pipe size is larger than the standard diameter

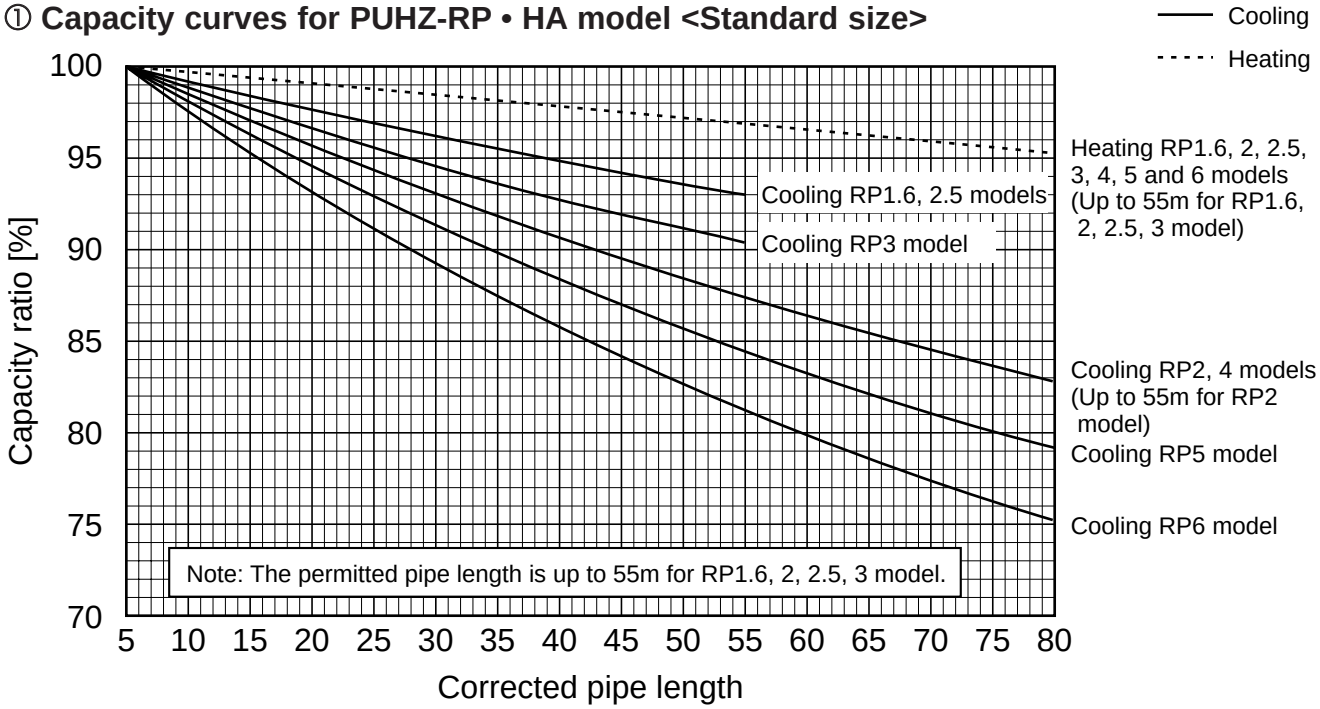
	Liquid pipe dia	Chargeless	Max. pipe length	Refrigerant amount to be added
RP1.6, 2	ϕ9.52	20m	30m	60 g per 1 m longer than 20 m
RP2.5, 3	ϕ12.7	20m	30m	100 g per 1 m longer than 20 m
RP4-6	ϕ12.7	20m	50m	100 g per 1 m longer than 20 m

(c) Capacity correction

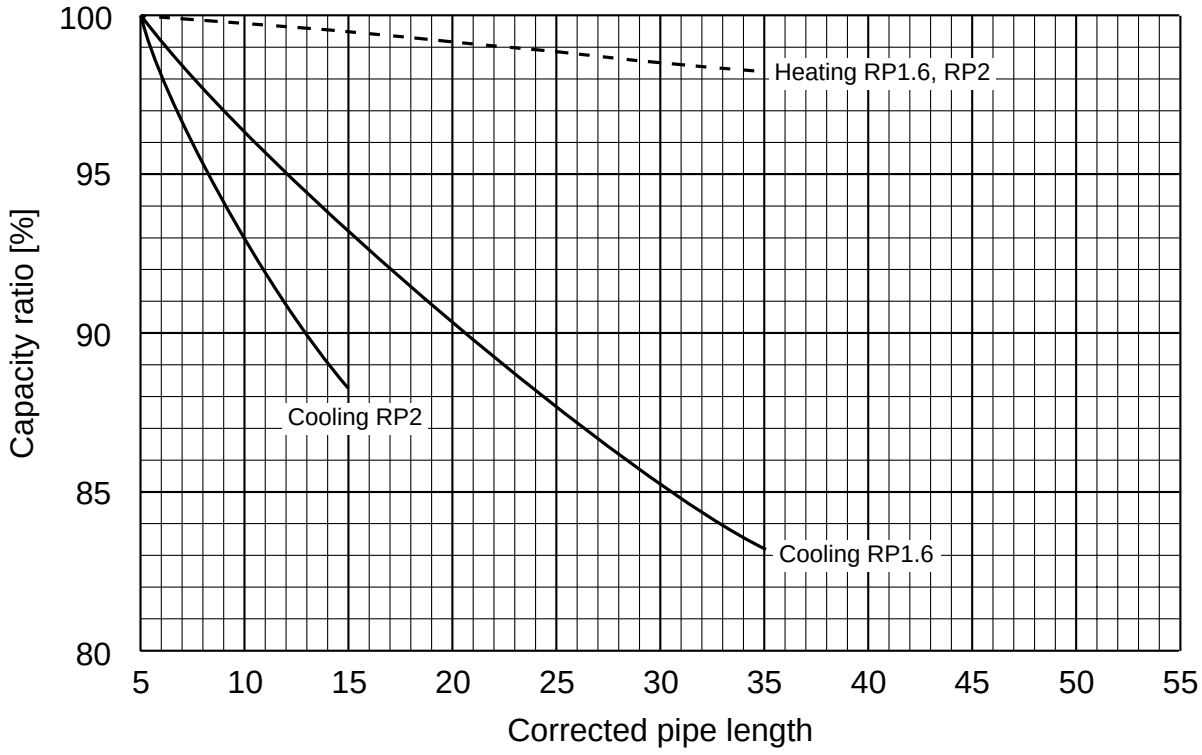
Cooling and heating capacity is lowered according to pipe length. Capacity can be obtained by referring to the capacity curves below. When the diameter of gas pipe is one size smaller than standard diameter, cooling capacity is lowered comparing to the standard diameter. The lowered capacity can be obtained by referring to capacity curves for gas pipe which is one size smaller than standard size.

Corrected pipe length (m) = actual pipe length (m) + number of bends x 0.3 (m)

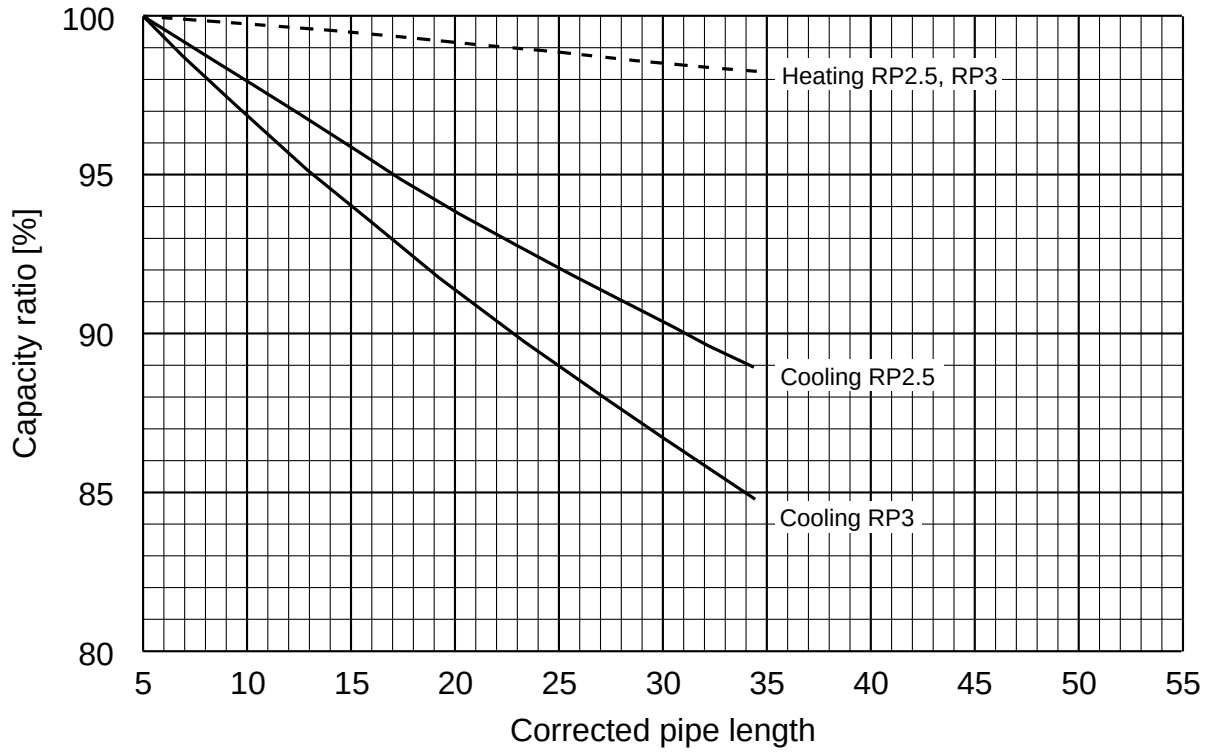
① Capacity curves for PUHZ-RP • HA model <Standard size>



② Capacity curve for PUHZ-RP1.6, 2 models <When gas pipe is one size smaller than standard size>



③ Capacity curve for PUHZ-RP2.5, 3 models
<When gas pipe is one size smaller than standard size>



④ When gas pipe is one size larger than standard size for PUHZ-RP4, 5 and 6.

① Capacity can be obtained by referring to capacity curves of standard size.

4-3-2. Synchronized twin and triple

(a) Pipe length

Please note that refrigerant piping length, bend number and height difference of indoor units are specified for each unit combination.

Note: Be sure to use our Multi-distributor for distributing pipe to use existing piping.

<Table 5>

Synchronized twin		Permitted total piping length A + B + C	Chargeless piping length A + B + C	Indoor unit's height difference [B and C]	Bend number ※ 2
Outdoor unit	PUHZ-RP3VHA PUHZ-RP3VHA-A	50 m or less	30 m or less	8 m or less	15 at most
	PUHZ-RP4-6VHA(-A) PUHZ-RP4-6YHA	75 m or less			

<Table 6>

Synchronized twin		Permitted total piping length A + B + C + D	Charge-less piping length A + B + C + D	Indoor unit's height difference [B and C] [C and D] [B and D]	Bend number ※ 2
Outdoor unit	PUHZ-RP6VHA(-A) PUHZ-RP6YHA	70 m or less	30 m or less	8 m or less	15 at most

Note 1: If total piping length exceeds charge-less piping length of 30 m, charge additional refrigerant according to the table 7.

<Table 7>

Outdoor unit	A + B + C (+D) Additional refrigerant to be charged (kg)				
	30 m or less	31 - 40 m	41 - 50 m	51 - 60 m	61 - 75 m
PUHZ-RP3VHA PUHZ-RP3VHA-A	Not required	0.6	1.2		
PUHZ-RP4-6VHA(-A) PUHZ-RP4-6YHA				1.8	2.4

※ Charge additional refrigerant from the check valve connected to the pipe of low-pressure side in indoor unit.

Note 2: Bends number (※ 2) should be within 8 for each combination, A + B, A +C and A + D, and 15 in all.

Note 3: Height difference between indoor and outdoor unit is referred to no matter which unit is located higher or lower.

<Table 8> Pipe length for twin of RP 3 - 6 (Piping length: A + B + C)

		RP3 Twin (RP1.6×2)		RP4 Twin (RP2×2)		RP5 Twin (RP2.5×2)		RP6 Twin (RP3×2)	
		Main pipe diameter [A]							
		Liquid ϕ6.35 Gas ϕ12.7	Liquid ϕ9.52 Gas ϕ15.88	Liquid ϕ9.52 Gas ϕ15.88	Liquid ϕ12.7 Gas ϕ19.05	Liquid ϕ9.52 Gas ϕ15.88	Liquid ϕ12.7 Gas ϕ19.05	Liquid ϕ9.52 Gas ϕ15.88	Liquid ϕ12.7 Gas ϕ19.05
Branch pipe diameter [B and C]	Liquid ϕ6.35 Gas ϕ12.7	×	○ 50 m	○75 m(✻2)	△ 50 m(✻1)	×	×	×	×
	Liquid ϕ9.52 Gas ϕ15.88	×	△ 50 m	△ 50 m	△ 50 m(✻1)	○75 m(✻2)	△ 50 m(✻1)	○75 m(✻2)	△ 50 m(✻1)
	Liquid ϕ12.7 Gas ϕ19.05	×	×	×	×	×	×	×	×

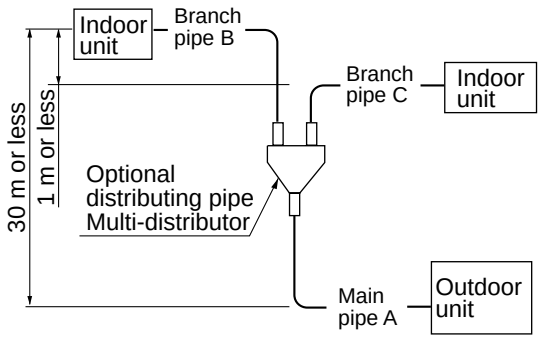
<Table 9> Pipe length for triple of RP6 (Piping length: A + B + C + D)

		Main pipe diameter [A]	
		Liquid ϕ9.52 Gas ϕ15.88	Liquid ϕ12.7 Gas ϕ19.05
Branch pipe diameter [B,C and D]	Liquid ϕ6.35 Gas ϕ12.7	○75 m(✻2)	△ 50 m(✻1)
	Liquid ϕ9.52 Gas ϕ15.88	△ 50 m	△ 50 m(✻1)
	Liquid ϕ12.7 Gas ϕ19.05	×	×

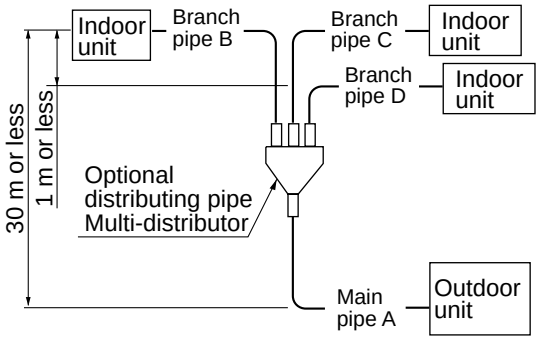
✻1 ··· Set DIP SW8-1 on outdoor unit control circuit board to ON.
✻2 ··· When using existing piping, pipe length should be 50 m at most.
✻3 ··· Height difference between indoor and outdoor unit should be kept within 30 m in every case.

[Marks in table]
○ ··· Normal piping
△ ··· It can be used with some changes of piping length and the amount of refrigerant to be charged.
× ··· It cannot be used.

Synchronized twin



Synchronized triple



1. Keep Stop valve in outdoor unit fully closed (as it is shipped), and after completing refrigerant piping connection, conduct air purge from service port of stop valve at outdoor unit.
2. After air purging, make the valve rod of stop valve at outdoor unit fully open.
   Now refrigerating cycle is complete between indoor and outdoor unit.
   Handle stop valve following the indication on outdoor unit.

Caution:

- Be sure to apply refrigerating oil to flare sheet face. Never apply it to screws. (As it causes flare nut loosening.)
- Use double spanner for piping connection.
- Be sure to check gas leak by using leak detector or soapy water.
- Use attached parts for refrigerant piping to provide correct insulation to the connection of indoor unit side in accordance with attached explanation sheet.
- Be sure to provide an oxidized brazing.

(b) Adjusting the amount of refrigerant

(i) In case of RP 3 twin
Check the additional refrigerant to be charged referring to table 2 when using pipe of size referred in table 8.

(ii) In case of RP4 - 6 twin or RP6 triple
When using liquid pipe one size larger than standard diameter for main pipe A, calculate the amount of additional refrigerant referring to ② below.

① When using piping of standard diameter or gas pipe one size larger than standard diameter for main pipe A.
Check the additional refrigerant to be charged referring to table 2 like 1:1 system.

② When using liquid pipe one size larger than standard diameter for main pipe A.
[In case of RP4-6 using liquid pipe of ϕ12.7]

- When total length of extension pipe (main pipe and branch pipe) is less than 20 m.
  No adjustment is required for refrigerant. (Chargeless)
- When total length of extension pipe (main pipe and branch pipe) is more than 20 m.
  Calculate the amount of additional refrigerant, referred to as △W (g) in the following, using the equation below and add proper amount of refrigerant. If △W is less than or equal to 0, no additional charge is required. (Chargeless)

[Additional refrigerant] △ W (g) = {100(g) × L1} + {60(g) × L2} + {30(g) × L3} - 2000(g)

Note: Put "0" in L1-3 if it is not used.

L1: Liquid pipe length of ϕ12.7 (m)
L2: Liquid pipe length of ϕ9.52 (m)
L3: Liquid pipe length of ϕ6.35 (m)

(c) Capacity correction

Apply pipe length between indoor and outdoor unit which is the longest of all for the calculation of capacity lowering according to each pipe length.

4-4. APPLICABLE EXTENSION PIPE FOR EACH MODEL PUHZ-RP8, 10YHA(-A)

4-4-1. 1:1 system

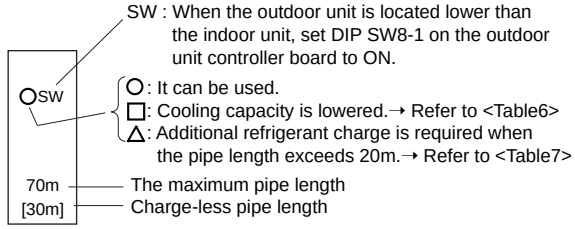
(1) Pipe length

<Table 1> Maximum pipe length (RP8·RP10)

Liquid pipe (mm)	OD	ϕ9.52				ϕ12.7				ϕ15.88			
	Thick-ness	t0.8				t0.8				t1.0			
gas pipe (mm)	OD	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
	Thick-ness	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0
RP8		□ 20m [20m]	□ 50m [30m]	Normal piping 70m※1 [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2 △SW 50m [20m]
RP10		□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	Normal piping 70m※1 [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2 △ 50m [20m]

Note : The maximum pipe length is 80m in case of new piping.
※1 Be sure to use hard (tempered) one for pipe over ϕ22.2.(Do not use soft (annealed) one.)
※2 When using ϕ31.75 pipe, the outdoor temperature range (dry-bub temperature) for heating operation is -11 to +21℃.

<Marks in the table above>



(2) Adjusting the amount of refrigerant

Check additional refrigerant charging amount referring to table 7 when the liquid pipe diameter is larger than the standard size, and table 2 when the pipe of the standard diameter is used.

<Table 2>

Outdoor unit	permitted pipe length	At time of shipping (kg)	Amount of additional refrigerant charge (kg)					
			30 m and less	31-40 m and less	41-50 m and less	51-60 m and less	61-70 m and less	71-80 m and less
RP8	80m or less	10.5	No additional charge necessary	0.9 kg	1.8 kg	2.7 kg	3.6 kg	The additional charge amount is obtained by the following formula.
RP10		10.5		1.2 kg	2.4 kg	3.6 kg	4.8 kg	

Calculate the additional charge amount based on the following procedure.
If the calculation results in an amount that is smaller than the "Additional charge amount for 70m," perform the additional charge using the amount shown in "Additional charge amount for 70m."

Amount of additional charge [kg]	=	Main piping: Liquid line size ϕ12.7 over all length [m] × 0.12 [kg/m]	+	Main piping: Liquid line size ϕ9.52 overall length [m] × 0.09 [kg/m]	+	Branch piping: Liquid line size ϕ9.52 overall length [m] × 0.06 [kg/m]	+	Branch piping: Liquid line size ϕ6.35 overall length [m] × 0.02 [kg/m]	–	3.6 (kg)

Additional charge amount for 70 m	RP8	3.6 kg
	RP10	4.8 kg

(3) Capacity correction

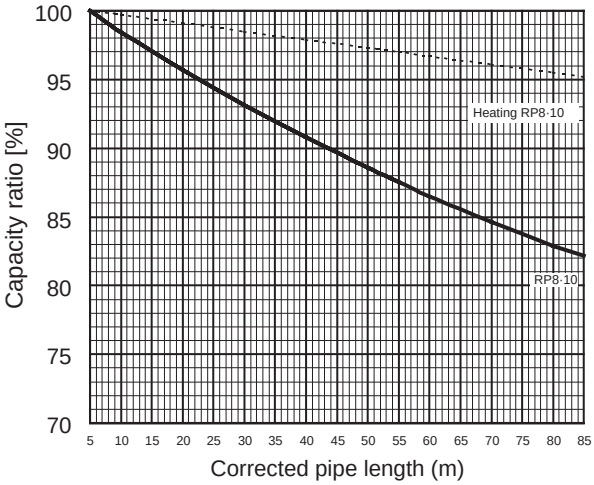
Cooling and heating capacity is lowered according to the piping length. Capacity can be obtained by referring to the following capacity curves.

When the diameter of the gas pipe is smaller than the standard size, cooling capacity is lowered comparing to the operation using the standard diameter pipe.

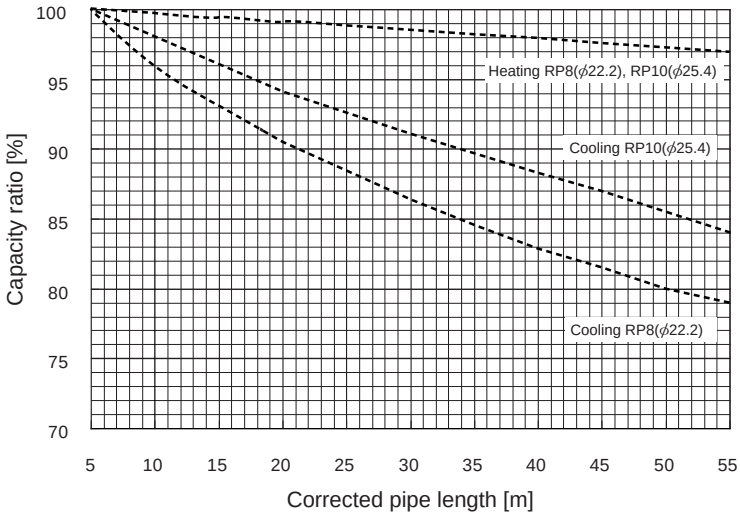
The lowered capacity can be obtained by referring to the capacity curves for gas pipe which is one or two size smaller than standard size.

Corrected pipe length (m) = actual pipe length (m) + number of bends × 0.3 (m)

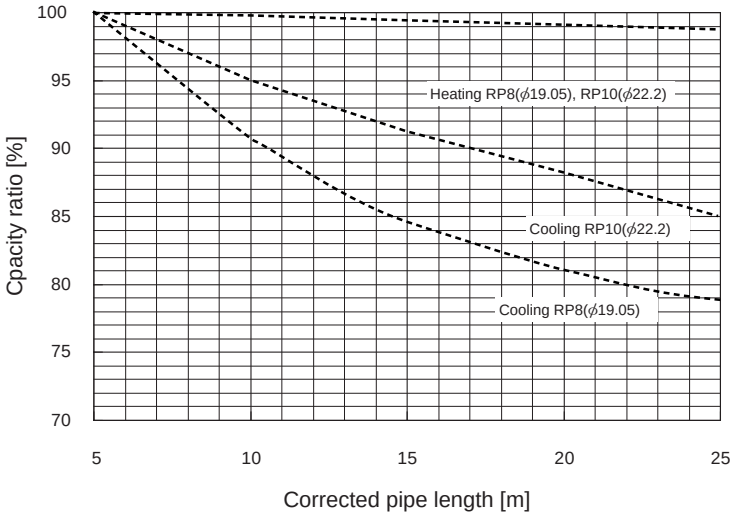
1. Capacity curves 1 <Standard size>



2. Capacity curves 2 <When the gas pipe's diameter is one-size-smaller than the standard



3. Capacity curves 3 <When the gas pipe's diameter is two-size-smaller than the standard



4-4-2. Synchronized twin, triple and quadruple system

(1) Synchronized twin

Maximum pipe length (Main pipe[A]+Branch pipe diameter [B and C])

			RP8 twin (RP4X2)												RP10 twin (RP5X2)											
Main pipe	Liquid pipe		ϕ9.52				ϕ12.7				ϕ15.88				ϕ9.52				ϕ12.7				ϕ15.88			
(mm)[A]	Gas pipe		ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
Branch pipe [mm] [B, C]	Liquid pipe	ϕ6.35																								
	Gas pipe	ϕ12.7																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	Normal piping 70m※1 [30m]	○ SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	Normal piping 70m※1 [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ15.88																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								
	Liquid pipe	ϕ12.7	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								

※1 The maximum pipe length is 80m in case of new pipping.
※2 When using ϕ31.75 pipe, the outdoor temperature range (dry-bulb temperature) for heating operation is -11 to +21℃.

(2) Synchronized triple

Maximum pipe length (Main pipe [A] + Branch pipe [B, C and D])

			RP8 triple (RP2.5X3)												RP10 triple (RP3X3)											
Main pipe	Liquid pipe		ϕ9.52				ϕ12.7				ϕ15.88				ϕ9.52				ϕ12.7				ϕ15.88			
(mm)[A]	Gas pipe		ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
Branch pipe [mm] [B, C, D]	Liquid pipe	ϕ6.35																								
	Gas pipe	ϕ12.7																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	Normal piping 70m※1 [30m]	○ SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	Normal piping 70m※1 [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ15.88																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								
	Liquid pipe	ϕ12.7	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								

※1 The maximum pipe length is 80m in case of new pipping.
※2 When using ϕ31.75 pipe, the outdoor temperature range (dry-bulb temperature) for heating operation is -11 to +21℃.

(3) Synchronized quadruple

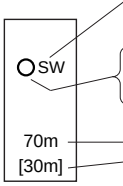
Maximum pipe length (Main pipe[A]+Branch pipe [B, C, D and E])

			RP8 quadruple (RP2X4)												RP10 quadruple (RP2.5X4)											
Main pipe	Liquid pipe		ϕ9.52				ϕ12.7				ϕ15.88				ϕ9.52				ϕ12.7				ϕ15.88			
(mm)[A]	Gas pipe		ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
Branch pipe [mm] [B, C, D, E]	Liquid pipe	ϕ6.35	□ 20m [20m]	□ 50m [30m]	Normal piping 70m※1 [30m]	○ SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ SW 50m [20m]	※2△SW 50m [20m]												
	Gas pipe	ϕ12.7																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	Normal piping 70m※1 [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ15.88																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								
	Liquid pipe	ϕ12.7													□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								

※1 The maximum pipe length is 80m in case of new pipping.
※2 When using ϕ31.75 pipe, the outdoor temperature range (dry-bulb temperature) for heating operation is -11 to +21℃.

<Marks in the table above>

SW : When the outdoor unit is located lower than the indoor unit, set DIP SW8-1 on the outdoor unit controller board to ON.



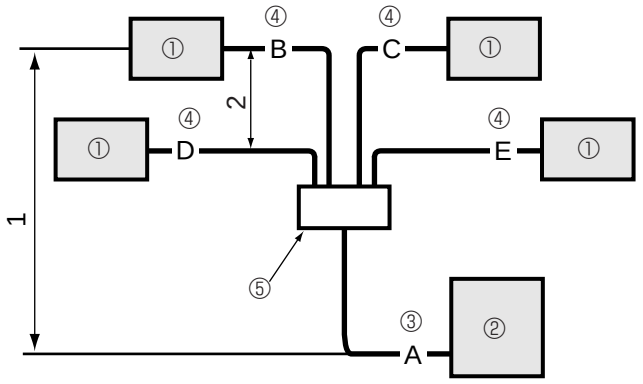
○ : It can be used.
□ : Cooling capacity is lowered.→ Refer to <Table6>
△ : Additional refrigerant charge is required when the pipe length exceeds 20m.→ Refer to <Table7>

70m — The maximum pipe length
[30m] — Charge-less pipe length

Pipe diameter and thickness

OD (mm)	ϕ6.35	ϕ9.52	ϕ12.7	ϕ15.88	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
Thickness (mm)	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.1

Be sure to use hard (tempered) one for pipe over ϕ22.2.(Do not use soft (annealed) one.)



① Indoor unit
② Outdoor unit
③ Main piping
④ Branch piping
⑤ Multi disttibution pipe (option)

1 Height difference (Indoor unit-Outdoor unit) Max. 40 m

2 Height difference (Indoor unit-Indoor unit) Max. 1 m

3 Distance between indoor and indoor units pipe length.

|B—C||B—D||B—E|
|C—D||C—E||D—E|

4 Number of pipe bends
Within 15
points8 points between main pipe A and each branch pipe (B, C, D, E).

<Table 6> Lowered cooling capacity by the smaller gas pipe diameter

Pipe length	RP8 Cooling capacity ratio		RP10 Cooling capacity ratio	
	gas pipe ϕ22.2	gas pipe ϕ19.05	gas pipe ϕ25.4	gas pipe ϕ22.2
5m and less	100%	100%	100%	100%
6~10m	100~96%	100~91%	100~98%	100~95%
11~20m	96~91%	91~81%	98~94%	95~88%
21~30m	91~86%	—	94~91%	—
31~40m	86~83%	—	91~88%	—
41~50m	83~80%	—	88~86%	—

<Table 7> Additional refrigerant amount when the liquid pipe of the larger diameter is used.
(Single /Simultaneous Twin / Simultaneous Triple / Simultaneous Quadruple)

Capacity	When the extension pipe length (main piping + branch piping) exceeds 20m
RP8, RP10	Additional refrigerant amountΔW(g)=(180×L_1)+(120×L_2) (90×L_3)+(30×L_4)-3000

L_1 : ϕ15.88 liquid pipe (m) L_2 : ϕ12.7 liquid pipe (m)
L_3 : ϕ9.52 liquid pipe (m) L_4 : ϕ6.35 liquid pipe (m)

If the calculation produces a negative number (i.e. a "minus" charge), additional charging is not necessary.
($\Delta W \leqq 0$)

<Table 8>

Outdoor unit	Permissible total piping length A+B+C+D+E	A+B or A+C or A+D or A+E	Charge-less piping length A+B+C+D+E
RP8 PR10	80 m and less	80 m and less	30 m and less

<Table 9>

Outdoor unit	| B-C | or | B-D | or | B-E |or | C-D | or | C-E | or | D-E |	Number of pipe bends
RP8 RP10	8 m and less	Within 15

<Table 10>

Outdoor unit	permitted pipe length	At time of shipping (kg)	A+B+C+D Amount of additional refrigerant charge (kg)					
			30 m and less	31-40 m and less	41-50 m and less	51-60 m and less	61-70 m and less	71-80 m and less
RP8	80m or less	10.5	No additional charge necessary	0.9 kg	1.8 kg	2.7 kg	3.6 kg	The additional charge amount is obtained by the following formula.
RP10		10.5		1.2 kg	2.4 kg	3.6 kg	4.8 kg	

When length exceeds 70 m

When the total length of the piping exceeds 70 m, calculate the amount of additional charge based on the following requirements.
Note: If the calculation produces a negative number (i.e. a “minus” charge), of if calculation results in an amount that is less than the “Additional charge amount for 70 m,”perform the additional charge using the amount shown in “Additional charge amount for 70 m.”

Amount of additional charge	=	Main piping: Liquid line size ϕ12.7 overall length 0.12	+	Main piping: Liquid line size ϕ9.52 overall length 0.09 (Gas line:ϕ28.58)	+	Branch piping: Liquid line size ϕ9.52 overall length 0.06 (Gas line: ϕ15.88)	+	Branch piping: Liquid line size ϕ6.35 overall length 0.02 (Gas line: ϕ15.88)	–	3.6 (kg)

Additional charge amount for 70 m	RP8	3.6 kg
	RP10	4.8 kg

1. Perform refrigerant piping connections for the indoor / outdoor unit while the outdoor unit's stopvalve is completely closed (factory setting), and then vacuumize the refrigerant lines through the service port of the outdoor unit.
2. Open the stop valves of the outdoor unit completely.
   This will completely connects the refrigerant lines of the indoor and outdoor units.
   Handling of the stop valve is shown on the outdoor unit.

Note :

- Apply refrigerating machine oil over the flare seat surface. Do not apply to the threaded portion. (It will cause the flare nut to loosen.)
- Use two wrenches to tighten piping connection.
- Use leak detector or soapy water to check for gas leaks after connections are completed.
- For the insulation of the connection at the indoor side, make sure to use the attached insulation materials and thoroughly follow the instruction shown in the manual.
- Always use a non-oxidizing brazing material when brazing the pipes.

Adjusting the amount of refrigerant

Check additional refrigerant charging amount referring to the procedure ② below when the liquid pipe diameter of the main piping A is larger than the standard size.

① When the standard diameter pipe is used for the main piping A, calculate the additional refrigerant amount by referring to <Table 2> as well as the 1:1 system.

② When the liquid pipe diameter of the main piping A is one size larger than the standard size:

- When the extension pipe length (main piping + branch piping) does not exceeds 20m, adjustment of the refrigerant is not necessary (charge-less).
- When the extension pipe length (main piping + branch piping) exceeds 20m, charge the amount of refrigerant that is obtained by the formula shown in <Table 7>.

If the calculation produces a negative number (i.e. a "minus" charge), additional charging is not necessary.
Note: Apply 0 to L1 to L3 corresponding to the piping that are not used.

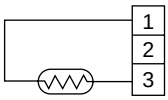
Correcting the capacity value

When calculating the lowered capacity by the extension pipe length, use the longest length between the indoor and the outdoor units.

5 HOW TO CHECK THE PARTS

5-1. INDOOR UNIT

• Common parts

Parts name	Check points
Room temperature thermistor (TH1) Pipe temperature thermistor/ liguid (TH2) Condenser/evaporator temperature thermistor (TH5)	Disconnect the connector then measure the resistance using a tester. (Surrounding temperature 10℃~30℃) Normal: 4.3kΩ~9.6kΩ / Abnormal: Open or short (Refer to below for a detail.)
Drain sensor 	Measure the resistance between the terminals using a tester. Measure the resistance after 3 minutes have passed since the power supply was intercepted. (Surrounding temperature 0℃~60℃) Normal: 0.6kΩ~6.0kΩ / Abnormal: Open or short (Refer to below for a detail.)

<Thermistor Characteristic graph>

Thermistor for lower temperature

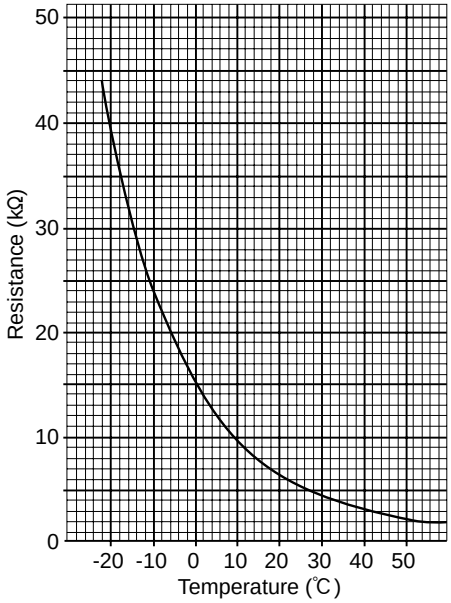
Room temperature thermistor(TH1)
Pipe temperature thermistor(TH2)
Condenser/evaporator temperature thermistor(TH5)

Thermistor R_0=15kΩ ± 3%
Fixed number of B=3480 ± 2%

$$Rt=15\exp\{3480(\frac{1}{273+t}-\frac{1}{273})\}$$

0℃	15kΩ
10℃	9.6kΩ
20℃	6.3kΩ
25℃	5.2kΩ
30℃	4.3kΩ
40℃	3.0kΩ

< Thermistor for lower temperature >



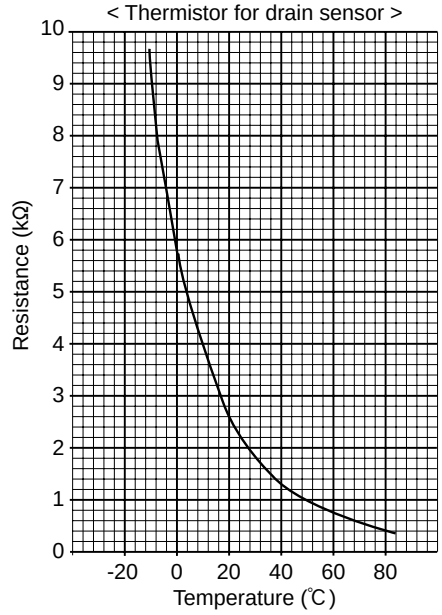
Drain sensor

Thermistor R_0=6.0kΩ ±5%
Fixed number of B=3390 ±2%

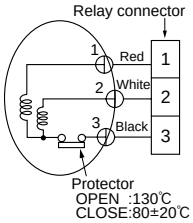
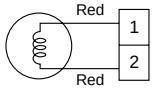
$$Rt=6\exp\{3390(\frac{1}{273+t}-\frac{1}{273})\}$$

0℃	6.0kΩ
10℃	3.9kΩ
20℃	2.6kΩ
25℃	2.2kΩ
30℃	1.8kΩ
40℃	1.3kΩ
60℃	0.6kΩ

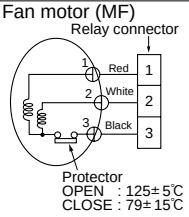
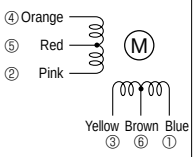
< Thermistor for drain sensor >



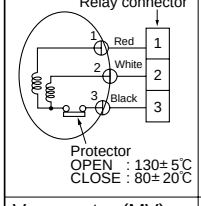
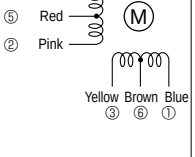
PLA-RP1.6AA
PLA-RP1.6AA.UK
PLA-RP3AA
PLA-RP3AA$_1$
PLA-RP3AA.UK
PLA-RP3AA$_1$.UK
PLA-RP2AA
PLA-RP2AA.UK
PLA-RP4AA
PLA-RP4AA$_1$
PLA-RP4AA.UK
PLA-RP4AA$_1$.UK
PLA-RP2.5AA
PLA-RP2.5AA.UK
PLA-RP5AA
PLA-RP5AA$_1$
PLA-RP5AA.UK
PLA-RP5AA$_1$.UK
PLA-RP6AA
PLA-RP6AA$_1$
PLA-RP6AA.UK
PLA-RP6AA$_1$.UK

Parts name	Check points
Vane motor	Measure the resistance between the terminals using a tester. (Surrounding temperature20℃) Normal: 15kΩ / Abnormal: Open or short
Fan motor 	Measure the resistance between the terminals using a tester. (Winding temperature 20℃) Motor terminal or Relay connector: Normal — PLA-RP1.6, 2, 2.5, 3AA / PLA-RP1.6, 2, 2.5, 3AA.UK / PLA-RP3AA$_1$ / PLA-RP3AA$_1$.UK: Red-Black 87.2Ω, White-Black 104.1Ω; PLA-RP4, 5, 6AA / PLA-RP4, 5, 6AA.UK / PLA-RP4, 5, 6AA$_1$ / PLA-RP4, 5, 6AA$_1$.UK: Red-Black 28.7Ω, White-Black 41.6Ω Abnormal: Open or short
Drain pump 	Measure the resistance between the terminals using a tester. (Winding temperature 20℃) Normal: 290Ω / Abnormal: Open or short

PKA-RP1.6GAL PKA-RP2GAL

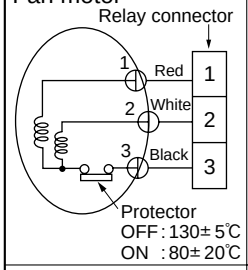
Parts name	Check points
Fan motor (MF) 	Measure the resistance between the terminals using a tester. (Winding temperature 20℃) Motor terminal or Relay connector: Normal — RP1.6 , RP2 Red – Black 120.5Ω, White – Black 111.3Ω Abnormal: Open or short
Vane motor (MV) 	Measure the resistance between the terminals using a tester. (Surrounding temperature 20℃~30℃) Connector: Brown – Yellow, Brown – Blue, Red – Orange, Red – Pink Normal: 186~214Ω Abnormal: Open or short

PKA-RP2.5FAL PKA-RP3FAL PKA-RP4FAL

Parts name	Check points
Fan motor (MF) 	Measure the resistance between the terminals using a tester. (Winding temperature 20℃) Motor terminal or Relay connector: Normal — RP2.5 / RP3 / RP4 Red – Black 99.5Ω / 62.6Ω, White – Black 103.9Ω / 74.0Ω Abnormal: Open or short
Vane motor (MV) 	Measure the resistance between the terminals using a tester. (Surrounding temperature 20℃~30℃) Connector: Brown –Y ellow, Brown – Blue, Red – Orange, Red – Pink Normal: RP2.5, RP3, RP4: 186~214Ω Abnormal: Open or short

PCA-RP2GA PCA-RP2.5GA PCA-RP3GA
PCA-RP4GA PCA-RP5GA PCA-RP6GA

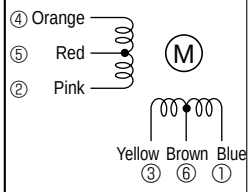
Fan motor



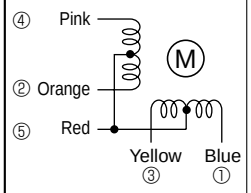
Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)

Motor terminal or Relay connector	Normal				Abnormal
	RP2	RP2.5, RP3	RP4	RP5, RP6	
Red – Black	70.6Ω	45.0Ω	43.7Ω	20.4Ω	Open or short
White – Black	69.6Ω	44.8Ω	55.3Ω	20.7Ω	

Vane motor

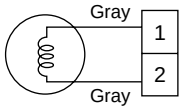


Connector	Normal		Abnormal
	RP2	RP2.5, RP3	
Brown – Yellow	186~214Ω	140~160Ω	Open or short
Brown – Blue			
Red – Orange			
Red – Pink			



Connector	Normal	Abnormal
	RP4, RP5, RP6	
Brown – Yellow	140~160Ω	Open or short
Brown – Blue		
Red – Orange		
Red – Pink		

Drain-up mechanism (Option)

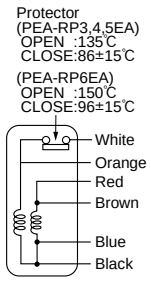


Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)

Normal	Abnormal
195Ω	Open or short

PEA-RP3EA.TH-A PEA-RP4EA.TH-A PEA-RP5EA.TH-A PEA-RP6EA.TH-A

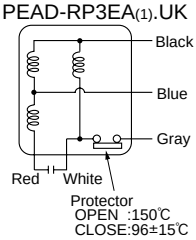
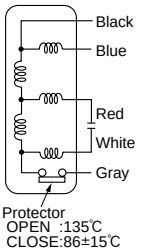
Fan motor (MF)



Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)

Motor terminal or Relay connector	Normal				Abnormal
	PEA-				
	RP3EA.TH-A	RP4EA.TH-A	RP5EA.TH-A	RP6EA.TH-A	
White – Black	28.6Ω	20.6Ω	15.3Ω	10.2Ω	Open or short
Black – Blue	12.5Ω	8.1Ω	5.1Ω	5.2Ω	
Blue – Brown	4.3Ω	3.2Ω	2.7Ω	3.1Ω	
Brown – Red	23.6Ω	16.0Ω	14.5Ω	12.1Ω	

PEAD-RP1.6EA.UK PEAD-RP2EA.UK PEAD-RP2.5EA.UK
PEAD-RP3EA.UK PEAD-RP4EA.UK PEAD-RP5EA.UK PEAD-RP6EA.UK
PEAD-RP3EA1.UK PEAD-RP4EA1.UK PEAD-RP5EA1.UK PEAD-RP6EA1.UK

Parts name	Check points
Fan motor (MF) PEAD-RP3EA(1).UK  PEAD-RP4,5,6EA(1).UK  	Measure the resistance between the terminals using a tester. (Winding temperature 20℃) **Motor terminal or Relay connector** / **Normal: PEAD-RP1.6, 2, 2.5EA.UK, PEAD-RP3EA(1).UK** / **Abnormal** Gray – Black (White or Red open): 43.5Ω — Open or short Black – Blue (White or Red open): 14.74Ω — Open or short Blue – Red (White or Red open): 57.5Ω — Open or short **Motor terminal or Relay connector** / **Normal: PEAD-** / **Abnormal** **RP4EA(1).UK** / **RP5EA(1).UK RP6EA(1).UK** Gray-Black (White or Red open): 24.76Ω / 10.27Ω — Open or short Blue – Black: 4.78Ω / 2.11Ω — Open or short Black – Red (White or Red open): 18.99Ω / 20.75Ω — Open or short Gray – Red (White or Red open): 36.63Ω / 25.44Ω — Open or short

PEAD-RP2.5GA
PEAD-RP3GA
PEAD-RP4GA

Parts name	Check points
Fan motor (MF) Protector: RP2.5, 3 — RP4 OPEN: 145±5°C — 135±5°C CLOSE: 94±15°C — 86±15°C	Measure the resistance between the terminals using a tester (winding temp. 20°C). **Motor terminal** / **Normal: RP2.5, 3** / **Normal: RP4** / **Abnormal** Orange-Gray: 35.0Ω / 35.2Ω — Open or short Orange-Black: 10.3Ω / 2.63Ω — Open or short Black-Blue: 5.87Ω / 3.00Ω — Open or short Blue-Yellow: 6.97Ω / 7.01Ω — Open or short Yellow-Red: 21.4Ω / — — Open or short Orange-Red: — / 50.7Ω — Open or short

5-2. OUTDOOR UNIT

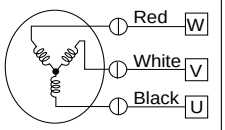
PUHZ-RP1.6HA **PUHZ-RP2VHA** **PUHZ-RP2.5VHA** **PUHZ-RP2.5VHA$_1$** **PUHZ-RP3VHA(-A)** **PUHZ-RP3VHA$_1$(-A)** **PUHZ-RP4VHA(-A)** **PUHZ-RP4VHA$_1$(-A)** **PUHZ-RP5VHA(-A)** **PUHZ-RP5VHA$_1$(-A)** **PUHZ-RP6VHA(-A)** **PUHZ-RP6VHA$_1$(-A)** **PUHZ-RP4YHA** **PUHZ-RP5YHA** **PUHZ-RP6YHA**

Parts name: Thermistor (TH3) <Outdoor pipe>, Thermistor (TH4) <Discharge>, Thermistor (TH6) <Outdoor 2-phase pipe>, Thermistor (TH7) <Outdoor>, Thermistor (TH8) <Heat sink>

Check points: Disconnect the connector then measure the resistance using a tester. (Surrounding temperature 10℃~30℃)

	Normal	Abnormal
TH4	160kΩ~410kΩ	Open or short
TH3 TH6 TH7	4.3kΩ~9.6kΩ	
TH8	39kΩ~105kΩ	

Parts name: Fan motor(MF1,MF2)



Pin number of relay connector is different from that motor connector

Check points: Measure the resistance between the terminals using a tester. (Winding temperature 20℃)

Relay connector	Normal			Abnormal
	RP1.6V, 2V	RP2.5-6V	RP4-6Y	
Red — Black	66.5±3.3Ω	15.1±0.5Ω	※	Open or short
Black — White				
White — Red				

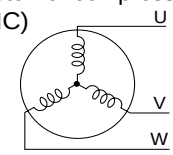
※ Refer to the next page for how to check the contact failure or how to measure the voltage at test point.

Parts name: Solenoid valve coil <Four-way valve> (21S4)

Check points: Measure the resistance between the terminals using a tester. (Surrounding temperature 20℃)

Normal		Abnormal
RP1.6-3V	RP4-6	Open or short
2350±170Ω	1370±100Ω	

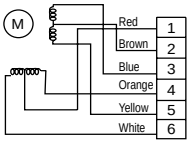
Parts name: Motor for compressor (MC)



Check points: Measure the resistance between the terminals using a tester. (Winding temperature 20℃)

Normal				Abnormal
RP1.6V, 2V	RP2.5V, 3V	RP4-6V	RP4-6Y	Open or short
0.300Ω~0.340Ω	0.865Ω~0.895Ω	0.266Ω	1.064Ω	

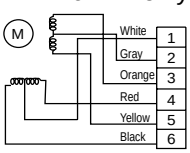
Parts name: Linear expansion valve (LEV(A),LEV(B)) RP1.6-RP6VHA only



Check points: Disconnect the connector then measure the resistance using a tester. (Winding temperature 20℃)

Normal				Abnormal
Red - White	Red - Orange	Brown - Yellow	Brown - Blue	Open or short
46±4Ω				

Parts name: Linear expansion valve (LEV(A),LEV(B)) RP4-RP6YHA only



Check points: Disconnect the connector then measure the resistance using a tester. (Winding temperature 20℃)

Normal				Abnormal
White - Black	White - Red	Gray - Yellow	Gray - Orange	Open or short
46±3Ω				

Parts name: Solenoid valve coil <Bypass valve> (SV) RP2.5-6 only

Check points: Measure the resistance between the terminals using a tester. (Surrounding temperature 20℃)

Normal	Abnormal
1197±10Ω	Open or short

Check method of DC fan motor (fan motor / outdoor controller circuit board)

① Notes

· High voltage is applied to the connecter (CNF1, 2) for the fan motor. Give attention to the service.

· Do not pull out the connector (CNF1, 2) for the motor with the power supply on.
(It causes trouble of the outdoor controller circuit board and fan motor.)

② Self check

Symptom : The outdoor fan cannot turn around.

Wiring contact check
Contact of fan motor connector (CNF1, CNF2)

↓

Is there no contact failure? → No → Wiring recovery

↓Yes

Power supply check
Measure the voltage in the outdoor controller circuit board.
TEST POINT ① : V_{DC} (between 1 (+) and 4 (-) of the fan connector): Vdc DC250-330V
TEST POINT ② : V_{CC} (between 5 (+) and 4 (-) of the fan connector): Vcc DC15V
TEST POINT ③ : V_{SP} (between 6 (+) and 4 (-) of the fan connector): Vsp DC1 to 6.5V
[The voltage of V_{SP} is a value during the fan motor operation.
In the case that the fan motor off, the voltages is 0V.]

↓

Is the voltage normal? → No→ Trouble of the outdoor controller circuit board
Replacement of the outdoor controller circuit board

↓Yes

Fan motor position sensor signal check
Measure the voltage at the TEST POINT ④ (VFG), between 7 (+) and 4 (-) of the fan connector, while slowly turning the fan motor more than one revolution.

↓

Dose the voltage repeat DC0V and DC15V? → No → Trouble of the fan motor
Replacement of the motor

↓Yes

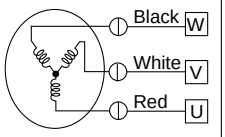
Replacement of the outdoor controller circuit board

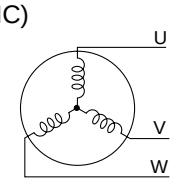
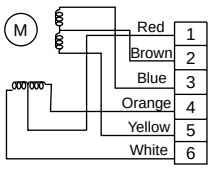
PUHZ-RP8YHA PUHZ-RP8YHA-A
PUHZ-RP10YHA PUHZ-RP10YHA-A

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Thermistor (TH3, TH32)
<Outdoor pipe>

Thermistor (TH4)
<Discharge>

Thermistor (TH6)
<Outdoor 2-phase pipe>

Thermistor (TH7)
<Outdoor></td><td>Disconnect the connector then measure the resistance using a tester.
(Surrounding temperature 10℃~30℃)
<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>TH4</td><td>160kΩ~410kΩ</td><td rowspan="2">Open or short</td></tr><tr><td>TH3, TH32
TH6
TH7</td><td>4.3kΩ~9.6kΩ</td></tr></table></td></tr>
<tr><td>Fan motor(MF1,MF2)
 

Pin number of relay connector is different from that motor connector</td><td>Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)
<table><tr><th>Relay connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Red — Black</td><td rowspan="3">15.3±0.5Ω</td><td rowspan="3">Open or short</td></tr><tr><td>Black — White</td></tr><tr><td>White — Red</td></tr></table></td></tr>
<tr><td>Solenoid valve coil
<Four-way valve>
(21S4)</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 20℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>1370±100Ω</td><td>Open or short</td></tr></table></td></tr>
<tr><td>Motor for compressor
(MC)
 
</td><td>Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>0.72Ω</td><td>Open or short</td></tr></table></td></tr>
<tr><td>Linear expansion valve
(LEV(A))
 
</td><td>Disconnect the connector then measure the resistance using a tester.
(Winding temperature 20℃)
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>Red - White</td><td>Red - Orange</td><td>Brown - Yellow</td><td>Brown - Blue</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">46±4Ω</td></tr></table></td></tr>
<tr><td>Solenoid valve coil
<Bypass valve>
(SV)</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 20℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>1197±10Ω</td><td>Open or short</td></tr></table></td></tr>
</table>

5-3. COMPRESSOR TECHNICAL DATA

(at 20°C)

Unit		PUHZ-RP1.6,2VHA	PUHZ-RP2.5,3VHA	PUHZ-RP4,5,6VHA	PUHZ-RP4,5,6YHA	PUHZ-RP8, 10YHA
Compressor model		SNB130FLBH	TNB220FMBH	ANV33FDAMT	ANV33FDBMT	ANV47FFBMT
Winding Resistance (Ω)	U-V	0.300 ~ 0.340	0.865 ~ 0.895	0.266	1.064	0.72
	U-W	0.300 ~ 0.340	0.865 ~ 0.895	0.266	1.064	0.72
	W-V	0.300 ~ 0.340	0.865 ~ 0.895	0.266	1.064	0.72

HOW TO CHECK THE COMPONENTS

<Thermistor feature chart>

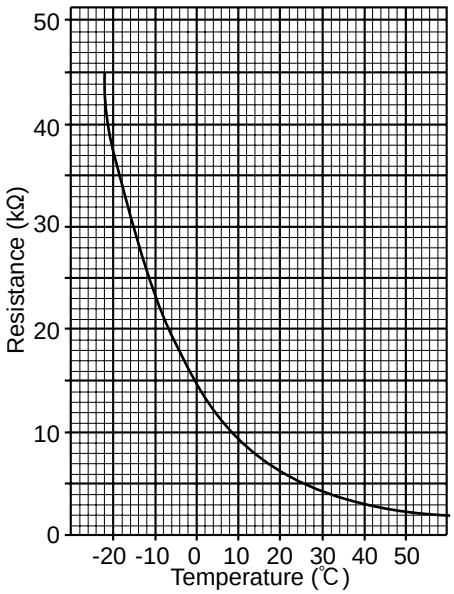
Low temperature thermistors

- Thermistor <Outdoor pipe> (TH3, TH32)
- Thermistor <Outdoor 2-phase pipe> (TH6)
- Thermistor <Outdoor> (TH7)

Thermistor R0 = 15kΩ ± 3%
B constant = 3480 ± 2%

$$R_t = 15\exp\{3480(\frac{1}{273+t} - \frac{1}{273})\}$$

0℃	15kΩ	30℃	4.3kΩ
10℃	9.6kΩ	40℃	3.0kΩ
20℃	6.3kΩ		
25℃	5.2kΩ		



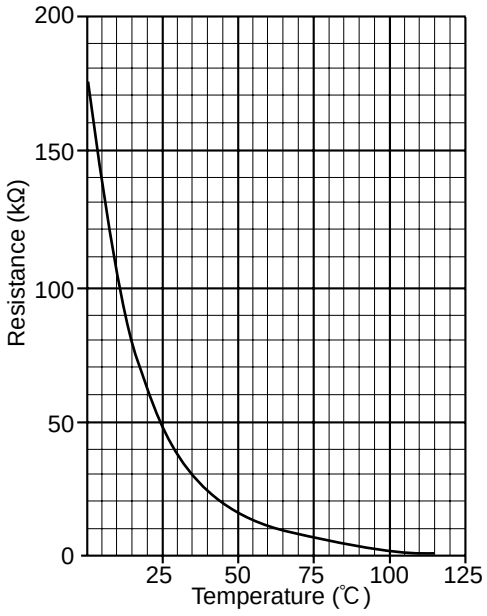
Medium temperature thermistor

- Thermistor <Heat sink> (TH8)

Thermistor R50 = 17kΩ ± 2%
B constant = 4150 ± 3%

$$R_t = 17\exp\{4150(\frac{1}{273+t} - \frac{1}{323})\}$$

0℃	180kΩ
25℃	50kΩ
50℃	17kΩ
70℃	8kΩ
90℃	4kΩ



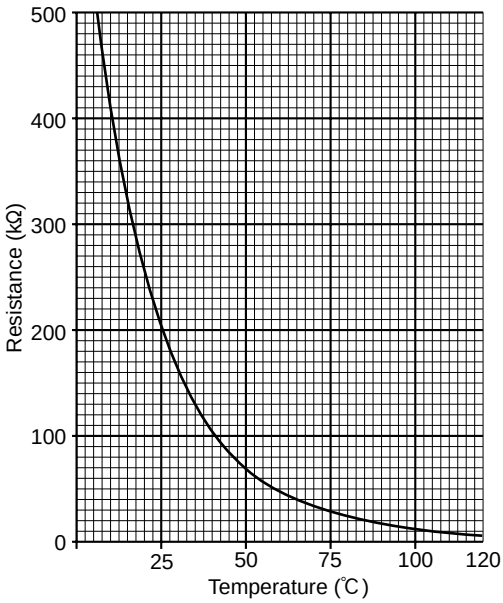
High temperature thermistor

- Thermistor <Discharge> (TH4)

Thermistor R120 = 7.465kΩ ± 2%
B constant = 4057 ± 2%

$$R_t = 7.465\exp\{4057(\frac{1}{273+t} - \frac{1}{393})\}$$

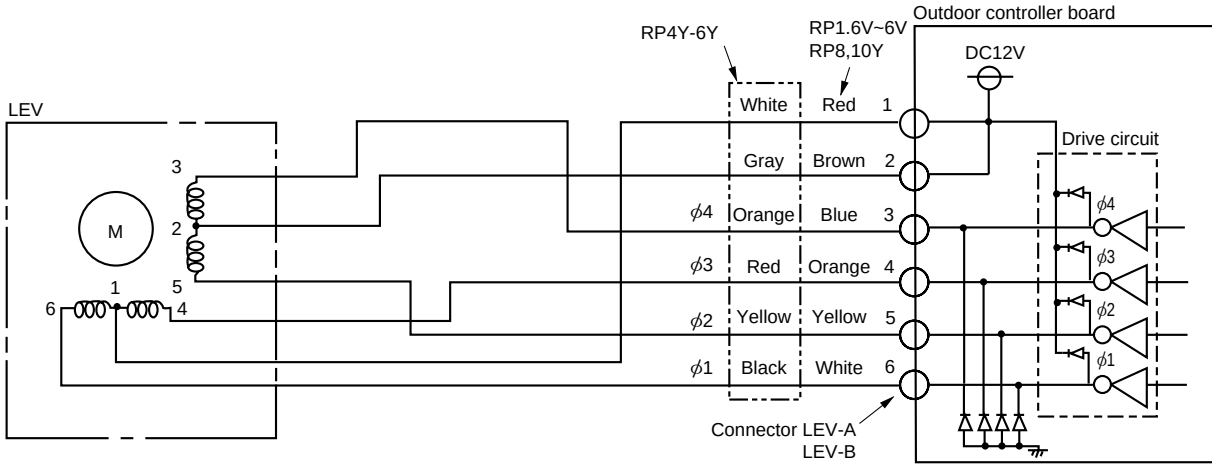
20℃	250kΩ	70℃	34kΩ
30℃	160kΩ	80℃	24kΩ
40℃	104kΩ	90℃	17.5kΩ
50℃	70kΩ	100℃	13.0kΩ
60℃	48kΩ	110℃	9.8kΩ



Linear expansion valve

(1) Operation summary of the linear expansion valve.

• Linear expansion valve open/close through stepping motor after receiving the pulse signal from the outdoor controller board.
• Valve position can be changed in proportion to the number of pulse signal.
<Connection between the outdoor controller board and the linear expansion valve>



<Output pulse signal and the valve operation>

Output (Phase)	Output							
	1	2	3	4	5	6	7	8
ϕ1	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
ϕ2	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
ϕ3	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
ϕ4	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

Opening a valve : 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1 → 8
Closing a valve : 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 1

The output pulse shifts in above order.

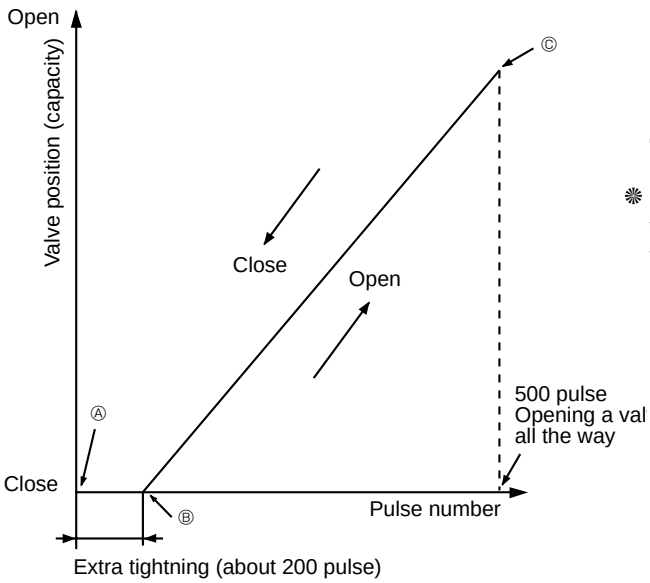
✵ 1. When linear expansion valve operation stops, all output phase become OFF.

✵ When the switch is turned on, 700 pulse closing valve signal will be sent till it goes to point Ⓐ in order to define the valve position. (The pulse signal is being sent for about 20 seconds.)

When the valve moves smoothly, there is no noise or vibration occurring from the linear expansion valve : however, when the pulse number moves from Ⓑ to Ⓐ or when the valve is locked, more noise can be heard than normal situation.
No noise is heard when the pulse number moves from Ⓑ to Ⓐ in case coil is burn out or motor is locked by open-phase.

✵ Noise can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

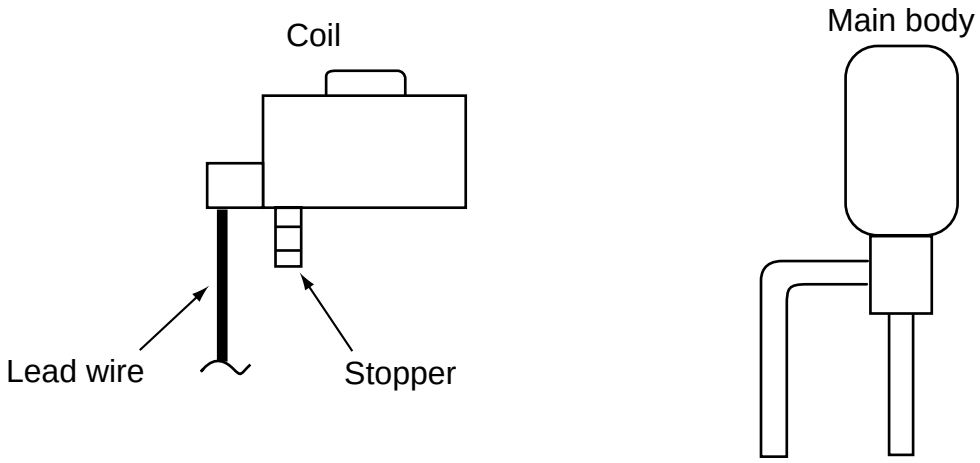
(2) Linear expansion valve operation



(3) How to attach and detach the coil of linear expansion valve(RP1.6V~6V, RP8,10Y)

<Composition>

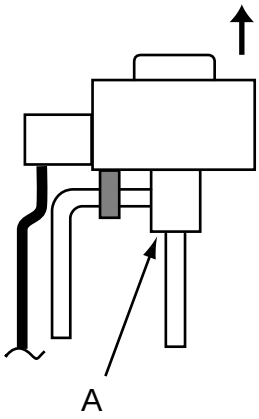
Linear expansion valve is separable into the main body and the coil as shown in the diagram below.



<How to detach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and detach the coil by pulling it upward.

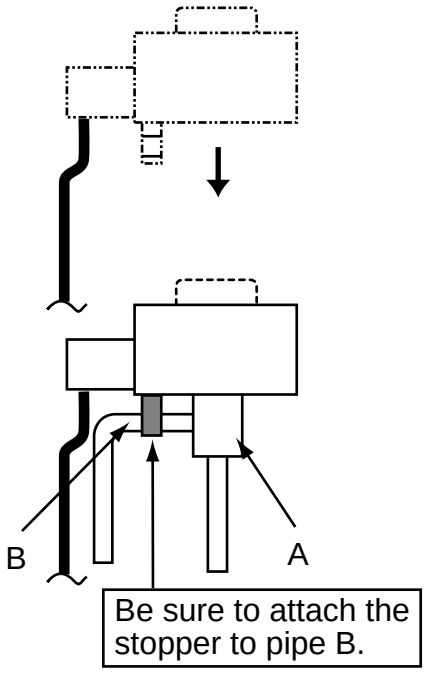
Be sure to detach the coil holding main body firmly. Otherwise pipes can bend due to pressure.



<How to attach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and attach the coil by inserting it downward into the main body. Then securely attach the coil stopper to pipe B. (At this time, be careful that stress is not added to lead wire and main body is not wound by lead wire.) If the stopper is not firmly attached to pipe B, coil may be detached from the main body and that can cause defective operation of linear expansion valve.

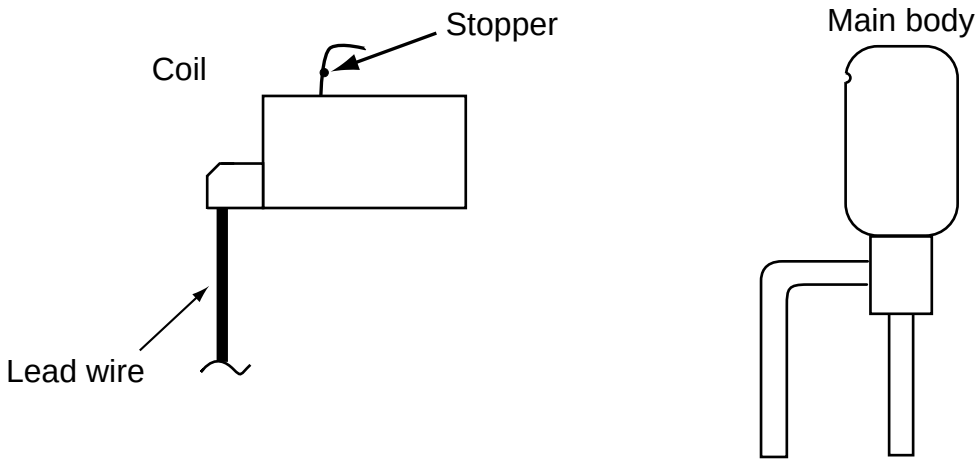
To prevent piping stress, be sure to attach the coil holding the main body of linear expansion valve firmly. Otherwise pipe may break.



(4) How to attach and detach the coil of linear expansion valve (RP4Y~ RP6Y)

<Composition>

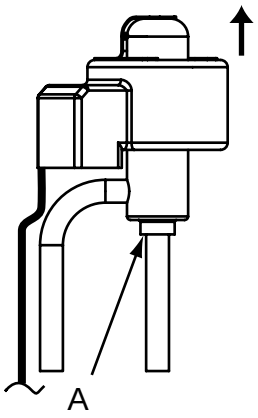
Linear expansion valve is separable into the main body and the coil as shown in the diagram below.



<How to detach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and detach the coil by pulling it upward.

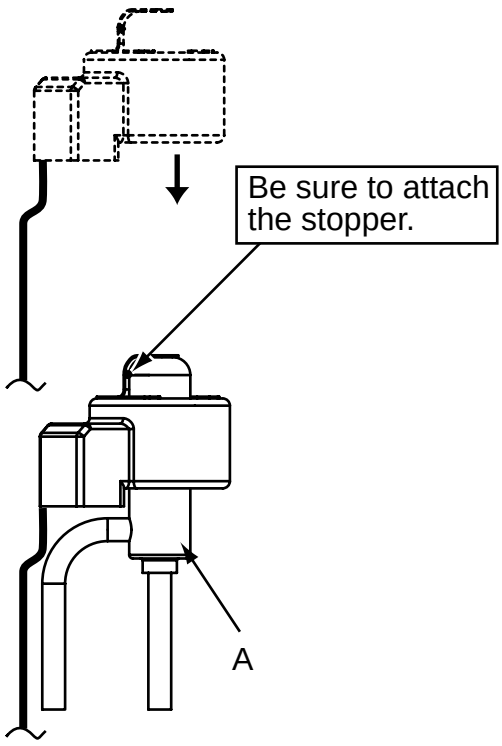
Be sure to detach the coil holding main body firmly. Otherwise pipes can bend due to pressure.



<How to attach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and attach the coil by inserting it downward into the main body. Then securely attach the coil stopper to main body. (At this time, be careful that stress is not added to lead wire and main body is not wound by lead wire.) If the stopper is not firmly attached to main body, coil may be detached from the main body and that can cause defective operation of linear expansion valve.

To prevent piping stress, be sure to attach the coil holding the main body of linear expansion valve firmly. Otherwise pipe may break.

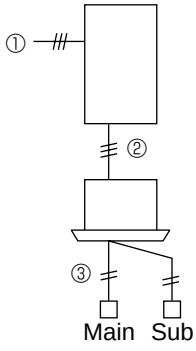


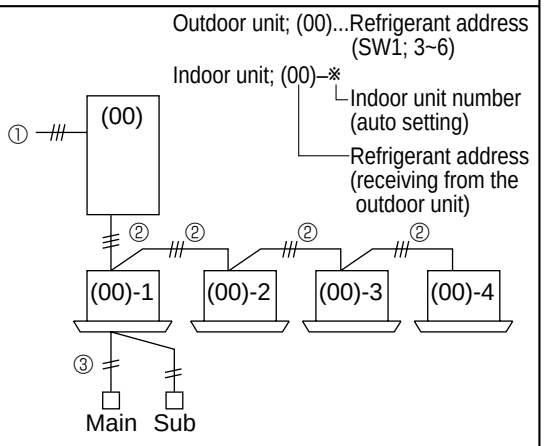
6 MICROPROCESSOR CONTROL

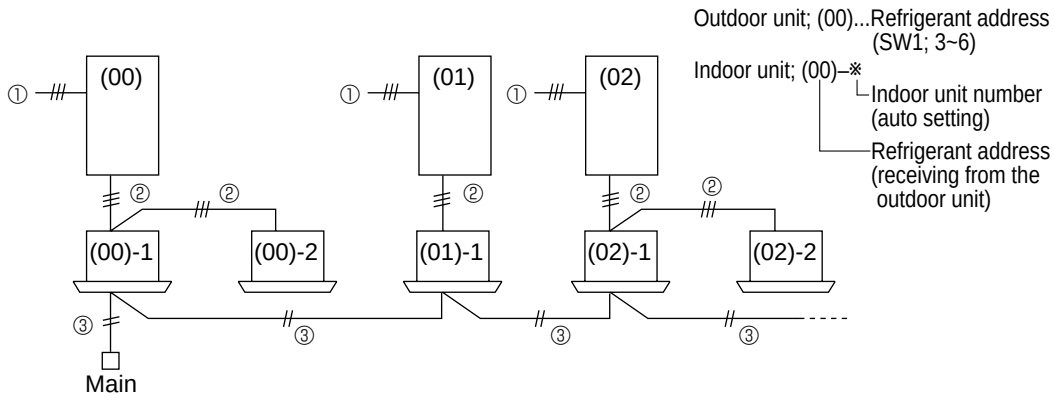
6-1. SYSTEM CONSTRUCTION

(1) System construction

A-control model which just wires the connecting line between the indoor and outdoor unit and supply the power is applicable to any models of standard (1:1), twin and triple. (Refer to 2 Start-up system.)

<table>
<tr><td colspan="2"></td><td>Standard 1:1</td><td>Synchronized Twin, Triple, Quadruple</td></tr>
<tr><td colspan="2">System construction</td><td> 

①Unit (outdoor) power supply L/N (PUHZ-RP•VHA) or L1/L2/L3/N (PUHZ-RP•YHA)
②Connecting line between the indoor and outdoor; S1/S2/S3, Polarized 3-wire
③Remote controller transmission line; Non polarized 2-wire</td><td> 

①Unit (outdoor) power supply L/N (PUHZ-RP•VHA) or L1/L2/L3/N (PUHZ-RP•YHA)
②Connecting line between the indoor and outdoor; S1/S2/S3, Polarized 3-wire
③Remote controller transmission line; Non polarized 2-wire</td></tr>
<tr><td rowspan="3">Various setting</td><td>Remote controller</td><td>Remote control main/sub setting necessity
(In case of 2 remote controllers)</td><td>Remote control main/sub setting necessity
(In case of 2 remote controllers)</td></tr>
<tr><td>Indoor unit</td><td>No setting</td><td>No setting (initial setting)</td></tr>
<tr><td>Outdoor unit</td><td>No setting</td><td>No setting (initial setting)</td></tr>
<tr><td colspan="2">Remarks</td><td></td><td>(1) Indoor unit number is set automatically</td></tr>
<tr><td colspan="2"></td><td colspan="2">Group control</td></tr>
<tr><td colspan="2">System construction</td><td colspan="2"> 

①Unit (outdoor) power supply L/N (PUHZ-RP•VHA), L1/L2/L3/N (PUHZ-RP•YHA)
②Connecting line between the indoor and outdoor; S1/S2/S3, Polarized 3-wire
③Remote controller transmission line; Non polarized 2-wire</td></tr>
<tr><td rowspan="3">Various setting</td><td>Remote controller</td><td colspan="2">Remote control main/sub setting necessity
(In case of 2 remote controllers)</td></tr>
<tr><td>Indoor unit</td><td colspan="2">No setting (initial setting)</td></tr>
<tr><td>Outdoor unit</td><td colspan="2">Refrigerant address setting; SW1; 3~6</td></tr>
<tr><td colspan="2">Remarks</td><td colspan="2">(1) Indoor unit number is set automatically
(2) When the refrigerant address of the unit is "00", Remote controller is supplied.</td></tr>
</table>

(2) The transmitting specification for “A” control

①Wiring regulations

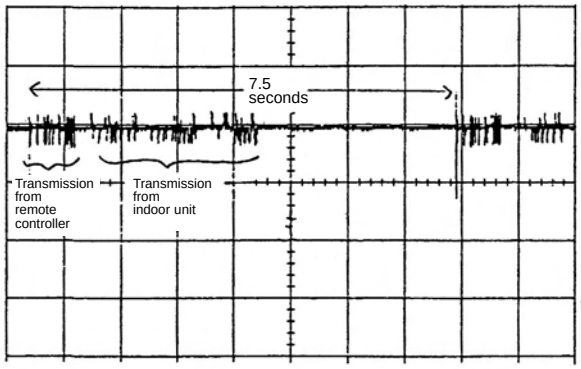
Section	Communications from remote controllers	Communications between indoor and outdoor units
The maximum length of total wiring	500m	80m (Including the wiring among indoor units in addition to the wiring between indoor and outdoor units)
The maximum numbers for connection	One remote controller can connect and operate up to 16 indoor units by grouping them.*1 One group can connect up to two remote controllers. *1 Remote controller considers multiplex units as a single group.	One outdoor unit can connect up to three indoor units.
The cables applicable	0.3mm^2 to 1.25mm^2	Use either flat-type cable (3 cores: ϕ1.6mm or more) or wires in the table below. *2 The diameter of the cables depends on each unit.
Others	The wirings as follows are not allowed: • The wiring that the indoor units of the same refrigerant system are connected through TB5. • The wiring which directly connects the terminals for remote controllers.	The core wire connected to terminal S2 shall be placed at the center of flat-type cable.

②Transmitting specification

Section	Communications from remote controllers	Communications between indoor and outdoor units
Transmitting speed	83.3 bit/sec. (1 bit = 12ms)	83.3 bit/sec. (1 bit = 12ms)
Normal transmission	The terminal for remote controller transmits signals every 7.5 seconds; the indoor unit whose refrigerant address is “0” responds them.	Outdoor unit transmits signals every 3 seconds; all the connected indoor units respond them.
Modulation	The waveform modulates at 50kHz.	There is no modulation.
Detection of abnormal communication	When transmitting error is detected for three consecutive minutes.	When transmitting error is detected for three consecutive minute.

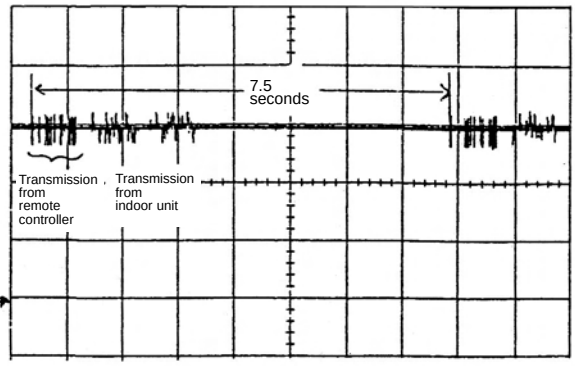
(3) The waveforms of from remote controller communications
The following graphs are the examples for measuring waveforms on the wirings of remote controlled transmission at the terminal block for remote controller.

a) A measuring example in the sequence of startup



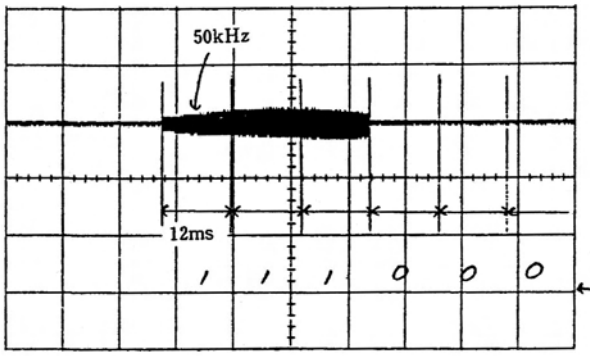
5V/div, 1sec/div:

b) A measuring example during normal stop



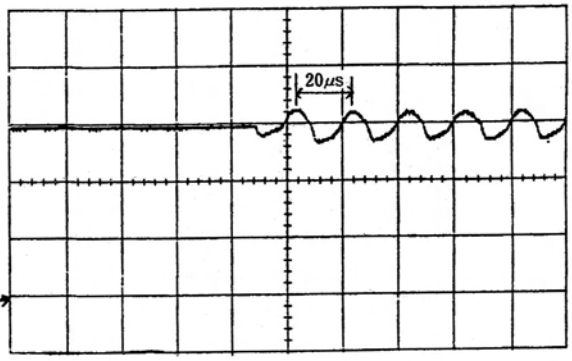
5V/div, 1sec/div:

c) Expanded waveform 1 (signal 111000....)



5V/div, 10msec/div:

d) Expanded waveform 2 (50Hz carrier)



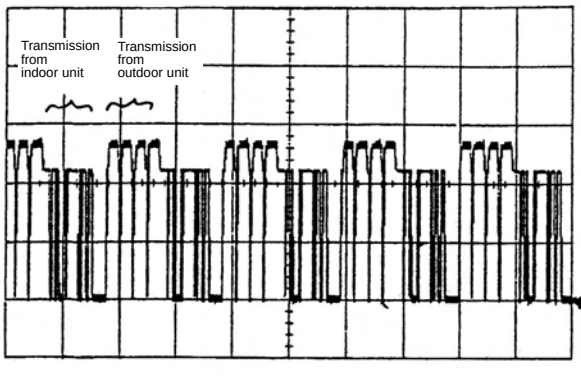
5V/div, 2μsec/div:

• During normal operation, the remote controller interactively exchanges signals with the indoor unit of refrigerant address “0”. When the remote controller cannot receive signals from the indoor unit of refrigerant address “0” for 3 minutes, it is considered as abnormal. E0 is displayed on the remote controller as an error.

(4) The waveforms of communications between indoor and outdoor units

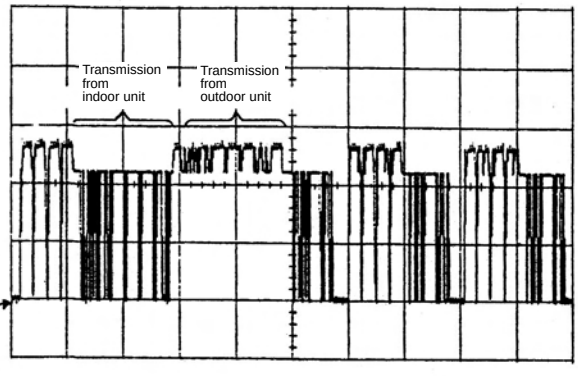
The following graphs are the examples for measuring waveforms on the wirings of connecting indoor and outdoor units at between S2 and S3 of the outdoor terminal block TB1.

a) A measuring example the sequence of startup: 1



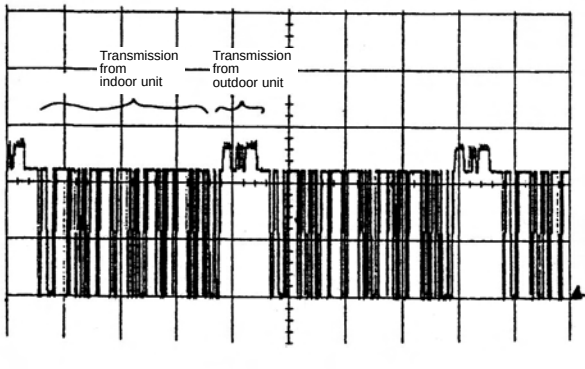
10V/div, 500msec/div:

b) A measuring example in the sequence of startup: 2



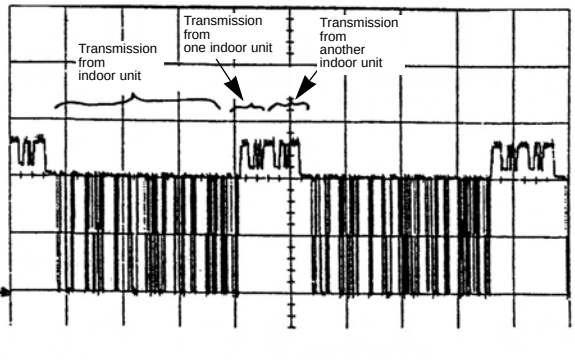
10V/div, 500msec/div:

c) A measuring example during normal stop
(When one outdoor unit connects one indoor unit)



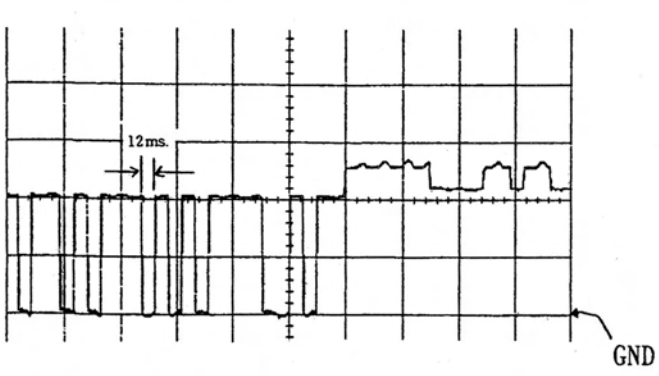
10V/div, 500msec/div:

d) A measuring example during normal stop
(When one outdoor unit connects two indoor units)



10V/div, 500msec/div:

c) Expanded waveform



10V/div, 50msec/div:

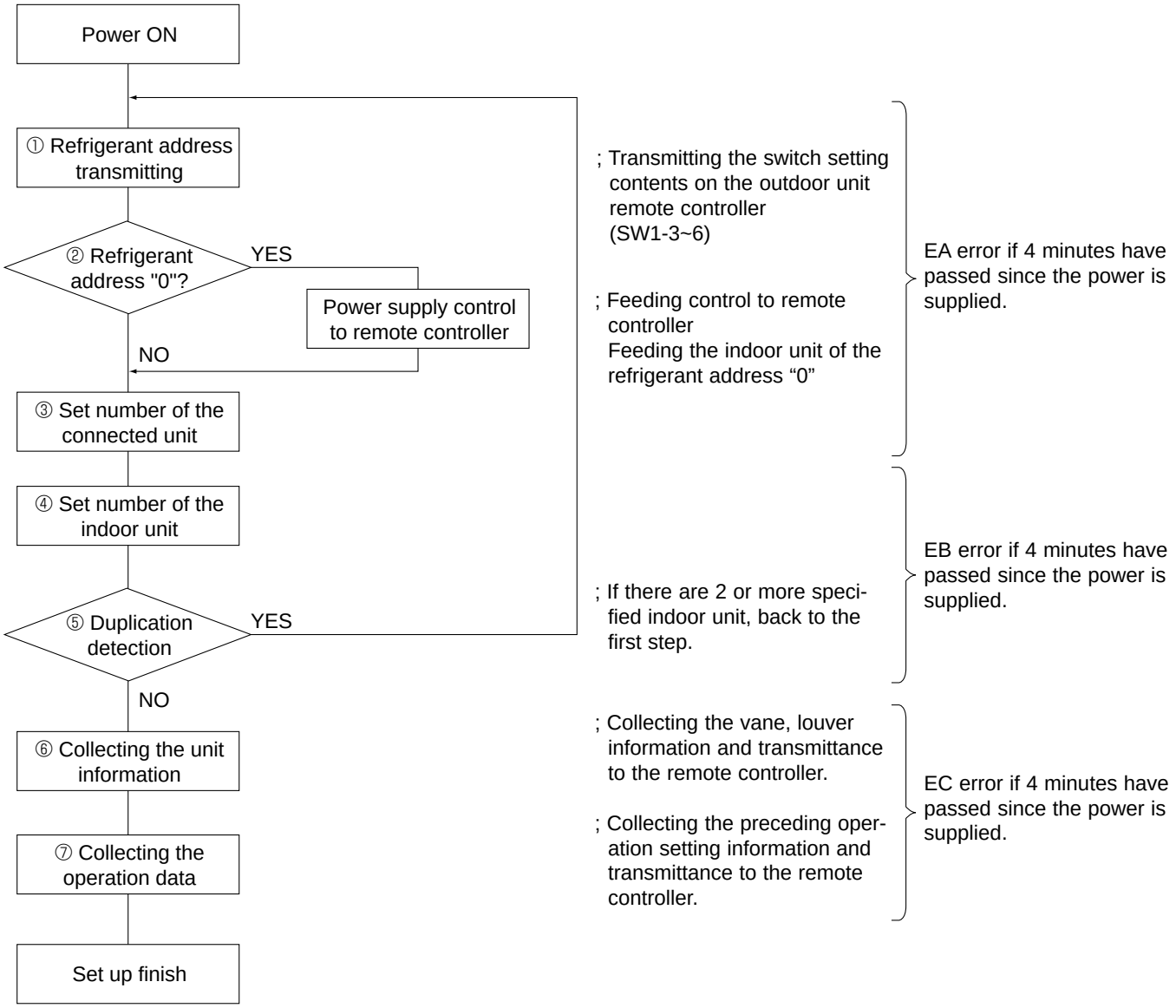
- During normal operation, outdoor unit interactively exchanges signals with all the connected indoor units.
- When outdoor unit cannot receive signals for three minutes from an indoor unit due to any trouble like cable disconnection, it is considered as abnormal and the outdoor unit stops. E8 is displayed on the remote controller. This is to avoid independent operation of indoor units.

(5) Start-up system

A control unit is applicable to any models of standard (1:1), twin and triple without switch setting according to carrying out the below process automatically when the power is supplied.

When the power is supplied, following processes of ① Refrigerant address transmitting, ② Power supply control to remote controller, ③ Set number of the connected unit, ④ Set number of the indoor unit, ⑤ Duplication detection, ⑥ Collecting the unit information and ⑦ Collecting the operation data are carried out as shown on the figure.

Also when detecting the duplicated setting in the step ⑤, back to the first step and reset it.



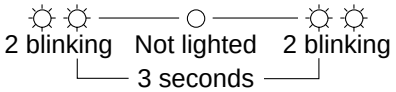
<<Feature>>

A. Start-up time from the second time will be shorter since setting of the number of connected units is memorized once set.
Start-up time can be estimated as following;
•When installing ... 1~2 minutes (Depending the number of connecting units)
•Since the second time .... 20 seconds ~ 1 minute (Depending the number of connecting units)
※ When the above processing does not finish, even if 4 minutes have passed, consider the processing an error and Ea, Eb or Ec will be displayed.
However if power is not supplied to the indoor unit due to miss-wiring or looseness of the connecting lines between the indoor and outdoor unit, there will be no display on the remote controller. Also when the data can not be received from the outdoor unit, E6 is displayed on the remote controller after 6 minutes.

B. When replacing the p.c.board, only the unit number which has had it`s p.c.board replaced is reset.
Even if the power supply is reset, the unit number which has not had it`s replaced does not change.

C. Automatic set unit is possible to confirm by blinking the frequency of LED3 in the indoor controller board.
At intervals of approx. 3 seconds, the number of the unit-number blinks.(Example:The unit(unit number:2) blinks twice at 3-second intervals.

Example



6-2. FUNCTION/ CONTROL SPECIFICATIONS

	Item		4-way ceiling cassette	Ceiling concealed		
			PLA-RP•AA	PEA-RP•EA	PEAD-RP•EA	PEAD-RP•GA
Function / specification	Fan	Number of fan speed	4	2	2	2
		Drive method	Pulsation (AC motor)	Tap-changing (AC motor)	Tap-changing (AC motor)	Tap-changing (AC motor)
	Up/down auto vane	Provided	○	—	—	—
		Swing function	○	—	—	—
		Shutter mechanism	○	—	—	—
		Motor type	Stepping (12V DC)	—	—	—
	Left/right swing louver	Provided	—	—	—	—
		Motor type	—	—	—	—
	Drain pump		○	—	△	△

Note: The parts marked △ are optional.

	Item		Ceiling suspended	Wall mounted	
			PCA-RP•GA	PKA-RP•GAL	PKA-RP•FAL
Function / specification	Fan	Number of fan speed	4	4	2
		Drive method	Phase control (AC motor)	Phase control (AC motor)	Phase control (AC motor)
	Up/down auto vane	Provided	○	○	○
		Swing function	○	○	○
		Shutter mechanism	○	○	○
		Motor type	Stepping (12V DC)	Stepping (12V DC)	Stepping (12V DC)
	Left/right swing louver	Provided	—	—	—
		Motor type	—	—	—
	Drain pump		△	—	△

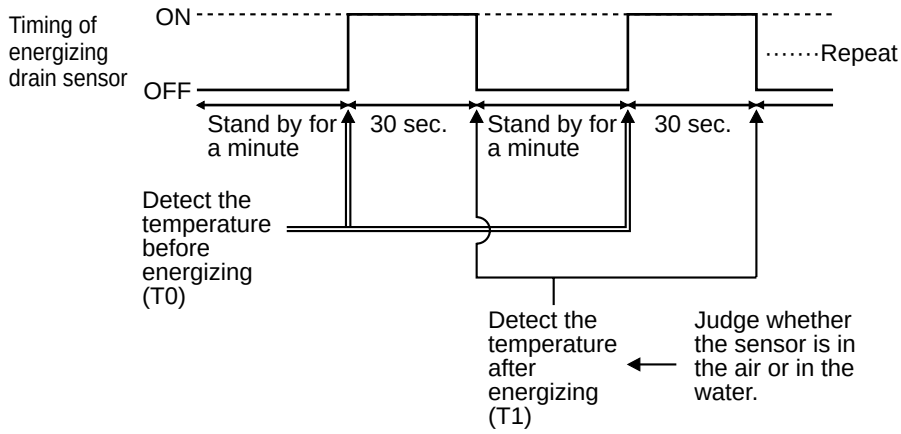
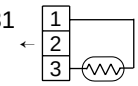
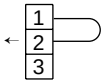
Note: The parts marked △ are optional.

7 INDOOR UNIT CONTROL

7-1. COOL OPERATION

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>1-1. Thermoregulating function (Function to prevent restarting for 3 minutes)
• Room temperature ≧ desired temperature +1℃ ⋯Compressor ON
• Room temperature ≦ desired temperature ⋯Compressor OFF
Crankcase heater: OFF when compressor operates
ON when compressor stopped (including when thermostat is OFF)
■Crankcase heater switches ON when 220-240V AC current is applied between connectors CH ① and ② on the outdoor control board.</td><td>※1 The thermoregulating function is provided in the outdoor unit.
The indoor unit transmits the indoor room temperature and set temperature data to outdoor unit, then the outdoor unit controls thermoregulation.</td></tr>
<tr><td></td><td>1-2. Anti-freezing control
Detected condition : When the liquid pipe temperature (TH2) or Condenser/ Evaporator temperature (TH5) (※3) is 2℃ or less (※4) in 16 minutes from compressors start up, anti-freezing control starts and the compressor will be suspended.
Released condition : The timer which prevents reactivating is set for 3 minutes, and anti- freezing control is cancelled when any one of the following conditions is satisfied.
① Liquid pipe temperature (TH2) and Condenser / Evaporator temperature (TH5) turn 10℃ or above.
② The condition of the compressor stop has become complete by thermoregulating, etc.
③ The operation modes became mode other than COOL.
④ The operation stopped.</td><td>Refer to ※2.
Refer to ※3.</td></tr>
<tr><td></td><td>1-3. Frozen protection
Detected condition : ① When the indoor pipe temperature (TH2) or Condenser/ Evaporator temperature (TH5) continues -15℃ for 3 minutes since 3 minutes has passed after the compressor start, the compressor stops and then the mode changes to prevent restarting for 6 minutes. After restarting of 6 minutes, when the indoor pipe temp. (TH2) or Condenser / Evaporator temperature (TH5) continues -15 or less for three minutes again by the time 16 minutes have passed, the frozen protection operates. (P6)
Detected condition : ② In case the indoor unit continues to be under the anti-freezing control for 9 minutes or more, the unit will be in a state of the suspensive abnormality. Restart the compressor after releasing the anti-freezing control. The suspensive abnormality will be cancelled if the compressor keeps operating for 20 minutes. However, the suspensive abnormality will turn into the abnormality if the anti-freezing control works again for 9 minutes during that period. On the other hand, the suspensive abnormality will be cancelled if the anti-freezing control works for less than 9 minutes
Released condition : When the operation stops by the remote controller operation.</td><td></td></tr>
<tr><td>2. Fan</td><td>By the remote controller setting (switch of 4 speeds or 2 speeds)
When determining the abnormality of the pipe temp. low speed fan is fixed.
<table><tr><th>Type</th><th>Fan speed notch</th></tr><tr><td>4 speeds type</td><td>[Low] [Medium2] [Medium1] [High]</td></tr><tr><td>2 speeds type</td><td>[Low] [High]</td></tr></table></td><td></td></tr>
</table>

※2 Compare liquid pipe temperature to Condenser/ Evaporator temperature, and the lower one is applied to anti-freezing control.
• Liquid pipe temperature ≦ Condenser/ Evaporator temperature····· Liquid pipe
• Liquid pipe temperature > Condenser/ Evaporator temperature····· Condenser/ Evaporator pipe
※3 The function of remote controller can change the temperature to start anti-freezing control.

Control modes	Control details	Remarks
3. Drain pump	3-1. Drain pump control •Always drain pump ON during the COOL and DRY mode operation. (Regardless of the compressor ON/ OFF) •When the operation mode has changed from the COOL or DRY to the others (including Stop), OFF the control after the drain pump ON for 3 minutes.	
	Drain sensor function • Energize drain sensor at a fixed voltage for a fixed duration. After energizing, compare the drain sensor's temperature to the one before energizing, and judge whether the sensor is in the air or in the water. **Basic control system** • While drain pump is turned on, repeat the following control system and judge whether the sensor is in the air or in the water.  •Drain sensor temperature rise (Δt) •Temperature of drain sensor before current is applied (T_0) •Temperature of drain sensor after current is applied (T_1) [$\Delta t = T_1 - T_0$]	✻1 Drain sensor Indoor controller board CN31  ✻2 If the unit is without the drain sensor, install the jumper connector. Indoor controller board CN31  When installing the jumper connector, determine to detect compulsorily in the air.
4. Vane (up/ down vane change)	(1) Initial setting : Start at COOL mode and horizontal vane. (2) Vane position : Horizontal →Downward A →Downward B →Downward C→Swing (3) Restriction of the downward vane setting When setting the downward vane A, B and C in [Medium2] or [Low] of the fan speed notch, the vane changes to horizontal position after 1 hour have passed.	✻1 Whether the unit has a swing function is listed in the function/ control specifications. ✻2 See the function/control specifications for the vane motor type. ✻3 "1Hr" appears on the wired remote controller.

7-2. DRY OPERATION

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>1-1. Thermoregulating function (Function to prevent restarting for 3 minutes)
Setting the compressor operation time by the thermoregulating signal and the room temperature (TH1).
Thermoregulating signal ON Room temperature ≧ desired temperature +1℃
Thermoregulating signal OFF Room temperature ≦ desired temperature
<table>
<tr><th>Room temp.</th><th>Thermoregulating signal</th><th>Operating time (min)</th><th>OFF time (min)</th></tr>
<tr><td rowspan="2">Over 18℃</td><td>ON</td><td>9</td><td>3</td></tr>
<tr><td>OFF</td><td>3</td><td>10</td></tr>
<tr><td>Less than 18℃</td><td colspan="3">Compressor operation stop</td></tr>
</table></td><td>*1
The thermoregulating function is provided in the outdoor unit.
The indoor unit transmits the indoor room temperature and set temperature data to outdoor unit, then the outdoor unit controls thermoregulation.</td></tr>
<tr><td></td><td>1-2. Frozen prevention control
No control function</td><td></td></tr>
<tr><td></td><td>1-3. Frozen protection
Same control as COOL operation</td><td></td></tr>
<tr><td>2. Fan</td><td>Indoor fan operation controlled depends on the compressor conditions.
<table>
<tr><th>Compressor</th><th>Fan speed</th></tr>
<tr><td>ON</td><td>[Low]</td></tr>
<tr><td>OFF</td><td>Stop (*1)</td></tr>
</table>
Note: Remote controller setting is not acceptable.</td><td>*1 Note that even when the compressor is OFF, the unit starts operating in [LOW] if the start condition below is met.
Start condition: The piping temperature (fluid piping or 2-phase piping) has fallen to 1℃ or less.
Release condition: The piping temperature (fluid piping or 2-phase piping) has returned to at least 10℃.</td></tr>
<tr><td>3. Drain pump</td><td>Same control as COOL operation</td><td></td></tr>
<tr><td>4. Vane
(up/ down vane change)</td><td>Same control as COOL operation</td><td></td></tr>
<tr><td>5. Louver
(Left/ right change)</td><td>Remote controller setting</td><td>*1 Model which is installed louver function.</td></tr>
</table>

7-3. FAN OPERATION

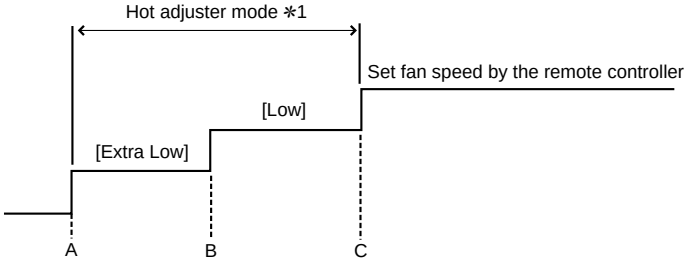
<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>None (always stopped)</td><td></td></tr>
<tr><td>2. Fan</td><td>Set by remote controller.
<table>
<tr><th>Number of fan speeds</th><th>Fan speed notches</th></tr>
<tr><td>4</td><td>[Low], [Medium2], [Medium1], [High]</td></tr>
<tr><td>2</td><td>[Low] [High]</td></tr>
</table></td><td></td></tr>
<tr><td>3. Drain pump</td><td>3.1 Drain pump control
The drain pump turns ON for the specified amount of time when any of the following conditions is met:
① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (FAN).
② ON for 6 minutes after the drain sensor is determined to be submerged using the liquid level detection method given below.
③ ON for 6 minutes after indoor piping (liquid piping) temperature - indoor intake temperature ≦ -10℃, AND the drain sensor input is at the short or open level.
(If condition ② or ③ is still being met after the drain pump has been turned ON for 6 minutes, the drain pump is kept ON for a further 6 minutes.)</td><td></td></tr>
<tr><td></td><td>3.2 Liquid level detection method
The liquid level is detected by determining whether or not the drain sensor is submerged, based on the amount the temperature rises after self-heating the sensor. This process is performed if any of the following conditions is met:
① Drain pump is ON.
② Indoor piping (liquid piping) temperature - indoor intake temperature ≦ -10℃
③ Indoor piping (liquid piping) temperature or indoor intake temperature is at the short or open level temperature.
④ Every hour after the drain pump has been switched from ON to OFF.</td><td></td></tr>
<tr><td>4. Vane
(up/ down vane change)</td><td>Same as the control performed during the COOL operation, but with no restriction on the vane's downward blow setting.</td><td></td></tr>
</table>

7-4. HEAT OPERATION

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>1-1. Thermoregulating function (Function to prevent restarting for 3 minutes)
• Room temperature ≦ desired temperature-1℃ ⋯Compressor ON
• Room temperature ≧ desired temperature ⋯Compressor OFF</td><td>∗1
The thermoregulating function is provided in the outdoor unit.

The indoor unit transmits the indoor room temperature and set temperature data to outdoor unit, then the outdoor unit controls thermoregulation.</td></tr>
<tr><td></td><td>1-2. Over- rise protection control
Detected control : When Condenser/ Evaporator temp. turns 74℃ or more, less than 90℃ after starting compressor, stop the compressor, then the mode changes to restarting compressor, stop the compressor, then the mode changes to restarting protection mode after 6 minutes.
After restarting after 6 minutes when the Condenser/ Evaporator temperature became 74℃ or more, less than 90℃ by the time 10 minutes pass, the mode changes to over-rise protection control.
Release control : When the operation stops by the remote controller.</td><td></td></tr>
<tr><td>2. Auxiliary heater</td><td>2-1. Thermoregulating function
When the mode is not Hot adjust or Defrosting mode during HEAT compressor operation, the controller changes to auxiliary heater ON.
Thermoregulating function follows the below table with according to desired temp. and room temp.
<table><tr><th>Temperature difference</th><th>Auxiliary heater</th></tr><tr><td>z < 0</td><td>OFF</td></tr><tr><td>0 ≦ z < 3</td><td>Keeping condition</td></tr><tr><td>3 ≦ z</td><td>ON</td></tr></table>temperature difference Z=Desired temperature - Room temperature
2-2. Over-rise prevention control
During the HEAT compressor operation, when the Condenser/ Evaporator temperature becames 63℃ or more, over-rise prevention control operates and the auxiliary heater prohibits for ON operation. When the indoor Condenser/Evaporator temperature is being 58℃ or less for 3minutes during over-rise prevention, over-rise prevention control will be released and auxiliary heater ON will be allowed.
(However, in case the Condenser/Evaporator temperature becomes 66℃ or more during over-rise prevention, 40℃ or less will be the requirement to release over-rise prevention control and allow auxiliary heater to be ON.)</td><td>∗1 Models without auxiliary heater also control the units in the same way as shown in the left.

∗2 During the over-rise prevention control, "Airflow increasing" in the indoor fan is controlled.
(Only the model of fan 4-speed)</td></tr>
</table>

Control modes	Control details	Remarks
3. Fan	Controlled by the remote controller (4-speed or 2-speed) Give priority to under-mentioned controlled mode 3-1. Hot adjuster mode 3-2. Preheating exclusion mode 3-3. Thermostat OFF mode (When the compressor off by the thermoregulating) 3-4. Cool air prevention mode (Defrosting mode) 3-5. Capacity increasing mode	∗1 Fan speed change notch Refer to the model function table
	3-1. Hot adjuster mode The fan controller becomes the stand by (hot adjuster) mode for the following conditions. ① When starting the HEAT operation ② When starting the compressor by the thermoregulating ③ When release the HEAT defrosting operation  A: Stand by (hot adjuster) mode start B: 5 min have passed since the condition A or the indoor Condenser/ Evaporator temperature turned 35℃ or more C: 2 min have passed since the condition A (Terminating the stand by (hot adjuster) mode)	∗1 "STAND BY" will be displayed during the stand by (hot adjuster) mode.
	3-2. Preheating exclusion mode When the condition changes the auxiliary heater ON to OFF (thermoregulating or operation stop, etc), the indoor fan operates in [Low] mode for 1 minute.	∗1 This control is same for the model without auxiliary heater.
	3-3. Thermostat OFF mode When the compressor stops by the thermoregulating, etc., the indoor fan operates in [Extra low].	∗1 Fan's airflow volume, when thermostat is OFF, can be changed by selecting the function of remote controller.
	3-4. Cool air prevention mode (Heat defrosting mode) After "not adjustment" mode is finished, the indoor fan will stop if ① or ② mentioned below is detected. When receiving "DEFROST" from the outdoor unit, the mode changes to defrosting mode. Pipe temp. (Condenser/ Evaporator) - Room temp. ≦ -5deg …① -5deg < pipe temp. (Condenser/ Evaporator) - Room temp. ≦ 5deg …② 5deg < pipe temp. (Condenser/ Evaporator) - Room temp. …③	∗1 "DEFROST "will be displayed on the remote controller during the defrost operation.
	3-5. Fan speed up mode •When the control changes to over-rise prevention. The condition of over-rise prevention (Prohibit for auxiliary heater ON) continues for 10 seconds or more and the set fan speed is [Low] or [Medium2], the fan speed changes to [Medium1]. •When the control changes to over-rise prevention during the heater OFF, the mode changes to capacity increasing mode immediately. The capacity increasing mode is canceled by canceling the over-rise prevention mode.	∗1 This control is applied for only 4-speed model.

Control modes	Control details	Remarks
4. Drain pump	4-1. Drain pump control The drain pump turns ON for the specified amount of time when any of the following conditions is met (regardless of whether the compressor is ON or OFF). ① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (HEAT mode). ② ON for 6 minutes after the drain sensor is determined to be submerged using the liquid level detection method given below. ③ ON for 6 minutes after indoor liquid pipe temperature - indoor intake temperature becomes -10deg or less AND the drain sensor input is at the short or open level. (If condition ② or ③ is still being met after the drain pump has been turned ON for 6 minutes, the drain pump is kept ON for a further 6 minutes.)	
	4-2. Liquid level detection method The liquid level is detected by determining whether or not the drain sensor is submerged, based on the amount of the temperature rise after the sensor is self-heated. This process is performed if any of the following conditions is met. ① Drain pump is ON. ② Indoor liquid pipe temperature - indoor intake temperature ≦ -10deg (except during defrosting) ③ Indoor liquid pipe temperature or indoor intake temperature is at the short or open level temperature. ④ Every hour after the drain pump has been switched from ON to OFF.	※ Refer to “7-1. COOL opration” for liquid level detection method.
5. Vane control (Up/ down vane change)	(1) Initial setting : OFF → HEAT…[last setting] When changing the mode from exception of HEAT to HEAT operation. …[Downward C] (2) Air flow direction [Horizontal]→[Downward A]→Downward B]→Downward C]→[Swing] (3) Determining position (When the timing motor of AC 200-240V) Control each air outlet angle considering the starting OFF → ON of limit switch to be a standard position (Horizontal or shutter). When the standard position can not be determined for 10 minutes, the vane stops at the arbitrary position. (Vane swing motion for 10 minutes) (4) Restriction of vane position The vane is horizontally fixed for the following modes. (The control by the remote controller is temporally invalidated and control by the unit.) •Compressor OFF mode (Thermoregulating, etc.) •Stand by (hot adjuster) [Extra low] mode •Cool prevention mode (Determining except for Heat area) •Heat defrost mode •Piping (Condenser/ Evaporator) temperature is 37℃ or less.	✻1 Whether the unit has a swing function is listed in the function/control specifications. ✻ See the function/control specifications for the vane motor type.

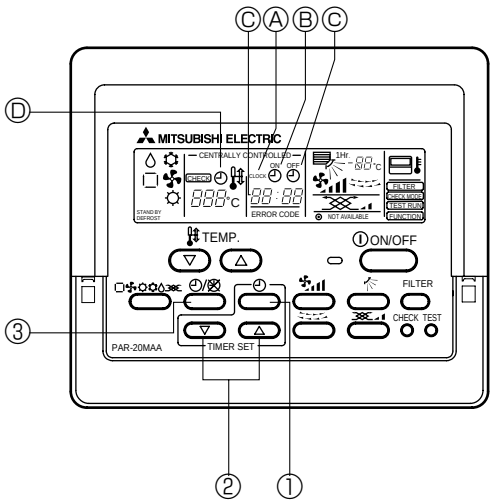
7-5. AUTO OPERATION

Control modes	Control details	Remarks
1. Initial value of operation mode	HEAT mode for room temperature < Desired temperature COOL mode for room temperature ≧ Desired temperature	✻This mode is provide in the outdoor unit. The indoor unit follows the instruction from the outdoor unit.
2. Mode change	(1) HEAT mode → COOL mode Room temperature ≧ Desired temperature + 2deg. or 15 min. has passed (2) COOL mode → HEAT mode Room temperature ≦ Desired temperature - 2deg. or 15 min. has passed	✻This mode is provide in the outdoor unit. The indoor unit follows the instruction from the outdoor unit.
3. COOL mode	Same control as cool operation	
4. HEAT mode	Same control as heat operation	

7-6. WHEN UNIT IS STOPPED CONTROL MODE

Control modes	Control details	Remarks
1. Drain pump	1.1 Drain pump control The drain pump turns ON for the specified amount of time when any of the following conditions is met (regardless of whether the compressor is ON or OFF) ① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (HEAT mode). ② ON for 6 minutes after the drain sensor is determined to be submerged using the liquid level detection method given below. ③ ON for 6 minutes after indoor piping (liquid piping) temperature - indoor intake temperature ≦ -10deg, AND the drain sensor input is at the short or open level. (If condition ② or ③ is still being met after the drain pump has been turned ON for 6 minutes, the drain pump is kept ON for a further 6 minutes.)	
	1.2 Liquid level detection method The liquid level is detected by determining whether or not the drain sensor is submerged, based on the amount the temperature rises after self-heating the sensor. This process is performed if any of the following conditions is met: ① Drain pump is ON. ② Indoor piping (liquid piping) temperature - indoor intake temperature ≦ -10deg (except during defrosting) ③ Indoor piping (liquid piping) temperature or indoor intake temperature is at the short or open level temperature. ④ Every hour after the drain pump has been switched from ON to OFF.	

7-7. TIMER OPERATION



▶ Available Timer-Interlocked Operation Modes

1. AUTO START/STOP:Allows both start and shutdown to be interlocked with the timer.
2. AUTO START: Allows automatic start in response to the timer setting and shutdown to be proceeded by manually pressing the ON/OFF button.
3. AUTO STOP: Allows the start of the operation to be manually invoked by pressing the ON/OFF button and automatic shutdown based on the timer setting.

▶ Timer-interlocked operation is available only once for both start and shutdown in 24 hours.

While Ⓓ ◴ is displayed, setting and changing of time for timer-interlocked operation is disabled.

In this case, press ③ button once to turn off the Ⓓ ◴ display on the remote controller. This is referred to as TIMER OFF operation.

1) Set the current time

1-1) Press the ① button and “CLOCK” Ⓐ will be displayed.
1-2) Press the ② button once to advance the current time by one.
Press the ② button once to set back the current time by one.
- Press and hold down either button to fast-forward (-reverse) the time setting.
- The display will disappear from about 10 seconds after the setting has been entered.

2) Set the time to start the unit as follows

2-1) Press the ① button and ON ◴ Ⓑ will be displayed.
2-2) Press the ② button to set the current time.
2-3) The --:-- field Ⓒ will be displayed.
The --:-- field Ⓒ will display a range of time between 23:50 and 00:00.
2-4) Press the ③ button and ◴ Ⓓ will be displayed.

3) Set time to stop the unit as follows

3-1) Press the ① button and OFF ◴ Ⓒ will be displayed.
3-2) Press the ② button to set the current time.
3-3) Set the automatic shutdown timer in the --:-- Ⓑ display.
3-4) Press the ③ button and ◴ Ⓓ will be displayed.

4) Changing the set times

- Enter a start time/shutdown time.
- Press the ③ button and ◴ Ⓓ will be displayed.

5) Cancelling the set times

- Press the ③ button to clear the remote controller`s display.

Note:

When the air conditioner is operated or is turned off after the timer setting has finished, the unit will automatically run without interruption the next time it is operated.

8 OUTDOOR UNIT CONTROL

8-1. COOL OPERATION

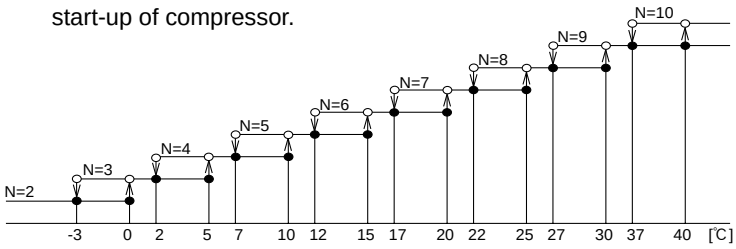
Control modes	Control details	Remarks
1. Compressor	1-1. Thermoregulating function The outdoor unit receives information of set temperature and intake temperature from the indoor unit through transmission and judges the necessity of thermoregulating from their temperature difference. (Refer to “INDOOR UNIT CONTROL” for detailed detecting method.)	
	1-2. Normal control Compressor operating frequency is controlled according to the difference between intake temperature and set temperature in order to let the intake temperature be the same as the set temperature • Control timing: Once per minute after 3 minutes have passed since the compressor started. • Frequency changing range: -12Hz to +20Hz ※: However, in the following cases, the frequency changing amount, which is different from the normal one, will be applied to control the operating frequency. (1) Frequency is fixed to the minimum just before the compressor is stopped by the thermoregulating function. Intake temperature ≦ Set temperature +0.5℃ ⋯ Fixed to the minimum frequency. Intake temperature ≦ Set temperature +1.0℃ ⋯ Fixation is released. (Returned to normal control.) (2) Correction of the frequency changing amount according to the estimated discharge temperature If the estimated discharge temperature is more than 113℃, the frequency changing amount will be corrected. • Correction amount: 0Hz to -6Hz	Refer to “8-7. Inverter control” for “Inverter control basic control frequency setting”.
	1-3. Start-up control Controls, which are conducted in 3 minutes after the compressor gets started, are categorized as below. (1) In case of start-up (first time) a. 0 min. to 1 min. after start-up: Fixed to 48Hz. b. 1 min. to 3 min. after start-up: Fixed to the Hz which has been regulated according to the temp. difference between intake temp. and set temperature • Fixed frequency: minimum Hz to 48Hz. (2) In case of restart a. 0 min. to 1 min. after start-up: Fixed to minimum Hz. b. 1 min. to 3 min. after start-up: Fixed to the Hz which has been regulated according to the temperature difference between intake temp. and set temperature • Fixed frequency: minimum Hz or 42Hz. Maximum Hz will be controlled to 70Hz for 10 minutes after the start-up of compressor.	
	1-4. Indoor anti-freezing control When the outdoor unit receives the signal of anti-freezing control mode, the compressor stops. The compressor will restart when the indoor anti-freezing control is released.	Refer to “INDOOR UNIT CONTROL” for the indoor anti-freezing control.
	1-5. Indoor frozen prevention control Frequency controls such as Hz-down and no more Hz-up will be conducted according to the indoor liquid pipe temp. (TH2) or indoor cond./eva. temp. (TH5). Temp. restriction: No more Hz-up ⋯ When TH2 or TH5 detects 4.5℃ or less Hz-down ⋯ When TH2 or TH5 detects 3.5℃ or less ※ ※ Hz-down amount: -5Hz per minute	

Continued to the next page.

From the previous page.

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>
1-6. Discharge temperature over-rise prevention control
Frequency controls such as Hz-down and no more Hz-up will be conducted according to the discharge temperature (TH4).
Temperature restriction: No more Hz-up … When TH4 detects 105℃ or more
Hz-down ····-6Hz per min. when TH4 detects 110℃ or more
····-10Hz per min. when TH4 detects 118℃ or more

1-7. Condensing temperature over-rise prevention control
Frequency controls such as Hz-down and no more Hz-up will be conducted according to the outdoor condenser/evaporator temperature (TH6)
<table>
<tr><td>Temperature restriction (TH6)</td><td>RP1.6~ 3</td><td>RP4~ 6</td><td>RP8, 10</td></tr>
<tr><td>No more Hz-up</td><td>58℃</td><td>56℃</td><td>54℃</td></tr>
<tr><td>Hz down (-5 Hz per min.).</td><td>60℃</td><td>58℃</td><td>56℃</td></tr>
<tr><td>Hz down (-10 Hz per min.).</td><td>63℃</td><td>61℃</td><td>59℃</td></tr>
</table>
1-8. Heat sink temperature over-rise prevention control ※1
Frequency controls such as Hz-down and no more Hz-up will be conducted according to the heat sink temperature (TH8).
Temperature restriction:
<table>
<tr><td>Models</td><td>No more Hz-up</td><td>Hz-down</td></tr>
<tr><td>PUHZ-RP1.6VHA</td><td>78℃</td><td>81℃</td></tr>
<tr><td>PUHZ-RP2VHA</td><td>78℃</td><td>81℃</td></tr>
<tr><td>PUHZ-RP2.5VHA</td><td>71℃</td><td>74℃</td></tr>
<tr><td>PUHZ-RP3VHA</td><td>71℃</td><td>74℃</td></tr>
<tr><td>PUHZ-RP4VHA</td><td>78℃</td><td>81℃</td></tr>
<tr><td>PUHZ-RP5VHA</td><td>78℃</td><td>81℃</td></tr>
<tr><td>PUHZ-RP6VHA</td><td>78℃</td><td>81℃</td></tr>
</table>
<table>
<tr><td>Models</td><td>No more Hz-up</td><td>Hz-down</td></tr>
<tr><td>PUHZ-RP4YHA</td><td>88℃</td><td>91℃</td></tr>
<tr><td>PUHZ-RP5YHA</td><td>88℃</td><td>91℃</td></tr>
<tr><td>PUHZ-RP6YHA</td><td>88℃</td><td>91℃</td></tr>
<tr><td>PUHZ-RP8YHA</td><td>88℃</td><td>91℃</td></tr>
<tr><td>PUHZ-RP10YHA</td><td>88℃</td><td>91℃</td></tr>
</table>
※ Hz-down amount: -5Hz per minute

1-9. Outdoor unit frozen protection control
If the cooling operation is continued for 16 hours, the compressor stops for 3 minutes.
</td><td>※1 Thermistor (TH8) for RP·YHA is with built-in the power-module.</td></tr>
<tr><td>2. Fan</td><td>
2-1. Normal control
Fan rotation times (rpm) will be controlled according to the outdoor outside temperature (TH7).
• Control method: Inverter control
• Rotation times: Fan step (N) = 0 and 2 to 10
• Compressor start-up: Fan step is fixed to 9 for 30 seconds after the start-up of compressor.


Outside temperature (TH7)

2-2. Correction of fan step according to the outdoor cond./eva. temperature
Fan step will be corrected according to the outdoor cond./eva. temp.(TH6).
• Correction range of condensing temperature : 30℃ to 53℃
• Correction range of fan step: -1 to +3

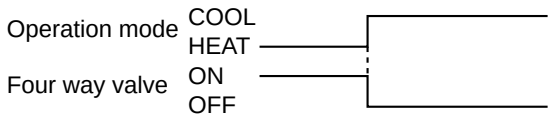
2-3. Correction of fan step according to the heat sink temperature
Fan step will be corrected according to the heat sink temperature (TH8).
• Correction range of heat sink temperature: 68℃ to 78℃
• Correction range of fan step: 0 to +2

2-4. Other
(1) Fan also stops when the compressor is being stopped. (Fan step = 0)
However, fan step will be set to 10 while the compressor is being stopped due to the abnormal heat sink temperature (Error code = U5).
At this time, the compressor is just waiting for 3 minutes to restart.
</td><td>
Step (N)—Rotation times(rpm)
<table>
<tr><td>Step (N)</td><td colspan="3">Rotation times(rpm)</td></tr>
<tr><td></td><td>RP1.6, 2</td><td>RP2.5, 3</td><td>RP4-6</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>105</td><td>95</td><td>125</td></tr>
<tr><td>2</td><td>135</td><td>115</td><td>155</td></tr>
<tr><td>3</td><td>165</td><td>135</td><td>175</td></tr>
<tr><td>4</td><td>205</td><td>165</td><td>200</td></tr>
<tr><td>5</td><td>265</td><td>200</td><td>240</td></tr>
<tr><td>6</td><td>340</td><td>245</td><td>285</td></tr>
<tr><td>7</td><td>430</td><td>305</td><td>360</td></tr>
<tr><td>8</td><td>530</td><td>450</td><td>465</td></tr>
<tr><td>9</td><td>680</td><td>700</td><td>700</td></tr>
<tr><td>10</td><td>700</td><td>720</td><td>720</td></tr>
</table>
<table>
<tr><td>Step (N)</td><td>Rotation times (rpm)</td></tr>
<tr><td></td><td>RP8, 10</td></tr>
<tr><td>0</td><td>0</td></tr>
<tr><td>1</td><td>60</td></tr>
<tr><td>2</td><td>80</td></tr>
<tr><td>3</td><td>100</td></tr>
<tr><td>4</td><td>120</td></tr>
<tr><td>5</td><td>160</td></tr>
<tr><td>6</td><td>220</td></tr>
<tr><td>7</td><td>320</td></tr>
<tr><td>8</td><td>440</td></tr>
</table>
<table>
<tr><td rowspan="2">Step (N)</td><td colspan="4">Rotation times (rpm)RP8, 10</td></tr>
<tr><td colspan="4">Compressor frequency(Hz)</td></tr>
<tr><td></td><td>~58</td><td>59~68</td><td>69~76</td><td>77~82</td></tr>
<tr><td>9</td><td>600</td><td>600</td><td>650</td><td>700</td></tr>
<tr><td>10</td><td>700</td><td>700</td><td>700</td><td>700</td></tr>
</table>
<table>
<tr><td rowspan="2">Step (N)</td><td colspan="3">Rotation times (rpm)RP8, 10</td></tr>
<tr><td colspan="3">Compressor frequency(Hz)</td></tr>
<tr><td></td><td>83~89</td><td>90~98</td><td>99~</td></tr>
<tr><td>9</td><td>550</td><td>600</td><td>600</td></tr>
<tr><td>10</td><td>750</td><td>600</td><td>700</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>3. LEV(A)
For RP1.6~ 6</td><td>
3-1. Normal control
Opening pulse will vary among steps (1 to 3) according to air conditioner's operating status.
• Control timing: Once every 5 minutes after 3 or 7 minutes have passed since the compressor started.
• LEV opening pulse for each step:
<table>
<tr><th>Step</th><th>RP1.6VHA</th><th>RP2VHA</th><th>RP2.5VHA</th><th>RP3VHA</th><th>RP4VHA</th><th>RP5VHA</th><th>RP6VHA</th><th>RP4VHA1
RP4YHA</th><th>RP5VHA1
RP5YHA</th><th>RP6VHA1
RP6YHA</th></tr>
<tr><td>1</td><td>195</td><td>200</td><td>150</td><td>200</td><td>220</td><td>220</td><td>220</td><td>220</td><td>220</td><td>220</td></tr>
<tr><td>2</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td><td>260</td><td>260</td><td>260</td></tr>
<tr><td>3</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td></tr>
</table>
• Requirement for step-up
LEV opening pulse will step up when any of following conditions is satisfied.
(1) The discharge temperature (TH4) is 100℃ or more
(2) The outdoor condenser/evaporetor temperature (TH6) is 57℃ or more
(3) The discharge super heat temperature is 50℃ or more Super heat temperature = Discharge temperature (TH4) - Outdoor condenser/evaporetor temperature (TH6)
(4) The sub cool temperature is 12℃ or more
Sub cool temperature = Outdoor condenser/evaporetor temperature (TH6) - Outdoor liquid pipe temperature (TH3)
• Requirement for step-down
LEV opening pulse will step down when any of following conditions is satisfied and any of step-up conditions are NOT satisfied.
(1) The discharge temperature (TH4) is 90℃ or less.
(2) The outdoor condenser/evaporetor temperature (TH6) is 52℃ or less.
(3) The discharge super heat temp. is 40℃ or less.
Super heat temperature = Discharge temperature (TH4) - Outdoor condenser/evaporetor temperature(TH6)
(4) The sub cool temperature is 3℃ or less.
Super heat temperature = Outdoor condenser/evaporetor temperature (TH6) - Outdoor liquid pipe temperature (TH3)
• The step does not change if neither step-up conditions nor step-down conditions are satisfied.
</td><td></td></tr>
<tr><td></td><td>
3-2. Compulsory step-up
When any of the following conditions is satisfied, the step will be forced to 3.
(1) The discharge temperature (TH4) is 110℃ or more.
(2) The condenser/evaporetor temperature (TH6) is 62℃ or more.
</td><td></td></tr>
<tr><td></td><td>
3-3. Stop control
When the LEV is being stopped, the step will be set to 3.
</td><td></td></tr>
</table>

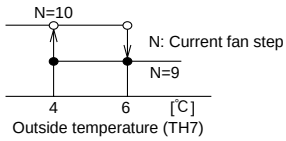
<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>4. LEV(B)
For RP1.6~6</td><td>4-1. Normal control
LEV opening pulse will be controlled according to the change of compressor operating frequency and regulated every minute to adjust the discharge temperature to let the intake super heat temperature be 0℃ to 5℃.
• Control timing: Once per minute after 3 or 7 minutes have passed since the compressor started.
• Opening pulse range: The following range is specified according to the compressor operating frequency.
<table>
<tr><th rowspan="2">Compressor frequency</th><th colspan="3">Opening pulse range (Lower limit to upper limit)</th></tr>
<tr><th>PUHZ-RP1.6, 2VHA</th><th>PUHZ-RP2.5, 3VHA</th><th>PUHZ-RP4,5,6VHA/YHA</th></tr>
<tr><td>49Hz or less</td><td>65 ~ 250</td><td>70 ~ 250</td><td>80 ~ 300</td></tr>
<tr><td>50Hz to 75Hz</td><td>95 ~ 350</td><td>105 ~ 350</td><td>90 ~ 350</td></tr>
<tr><td>76Hz to 90Hz</td><td>120 ~ 400</td><td>160 ~ 400</td><td>100 ~ 400</td></tr>
<tr><td>91Hz or more</td><td>140 ~ 480</td><td>160 ~ 480</td><td>120 ~ 480</td></tr>
</table>
• Opening pulse range corresponding to the change of compressor operating frequency
Opening pulse range = Present opening pulse × (Target frequency / Operating frequency -1) × 0.8
• Compressor start-up
Opening pulse will be adjusted according to only the change of frequency during 3 or 7 minute start-up. The start-up control time will be changed according to the discharge temperature (TH4).
Discharge temperature (TH4) ≧ 30℃: 3 minute start-up
Discharge temperature (TH4) < 30℃: 7 minute start-up</td><td></td></tr>
<tr><td></td><td>4-2. Evaporation protection control
The targeted opening pulse should be made large in the condition written below.
Indoor cond./eva. temperature (TH5) - Indoor liquid pipe temperature (TH2) ≧ 6℃
Set the targeted value of the discharge temperature about 5 to 15℃ lower.
※ This control does not work for 3 or 7 minutes after the compressor gets started.</td><td></td></tr>
<tr><td></td><td>4-3. Low discharge super heat temperature protection control
Set a small value for the targeted opening pulse according to the discharge super heat temperature.
• Correction range of the discharge super heat temp. : 10℃ or less
※ This control does not work for 3 or 7 minutes after the compressor gets started.</td><td>Discharge super heat temp. is calculated from discharge temp. (TH4) and outdoor cond./eva. temp. (TH6).</td></tr>
<tr><td></td><td>4-4. Others
① LEV opening pulse is set to 400 while the compressor is being stopped.
② After LEV opening pulse is initialized to 0 by making 700 pulse down from the present pulse, set the pulse to 400.
③ 20 pulses are added to the present pulse if the following conditions are satisfied within 14 minutes after the compressor gets started.
COOL: Indoor cond./eva. temperature (TH5) - Indoor liquid pipe temperature (TH2) ≧ 25℃
HEAT: Outdoor cond./eva. temperature (TH6) - Outdoor liquid pipe temperature (TH3) ≧ 25℃</td><td></td></tr>
</table>

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>5. LEV
RP8, 10</td><td>
5-1. Target sub cool (SC)
Compressor operating frequency < 40Hz Target SC step = 2
Compressor operating frequency ≧ 40Hz Target SC step = 3
<table>
<tr><th>Target SC step</th><th>Target SC range</th></tr>
<tr><td>1</td><td>2℃~4℃</td></tr>
<tr><td>2</td><td>3℃~5℃</td></tr>
<tr><td>3</td><td>5℃~8℃</td></tr>
<tr><td>4</td><td>8℃~10℃</td></tr>
</table>
5-2. Normal control
LEV opening pulse will be controlled according to the change of compressor operating frequency and regulated to adjust the SC to let the target SC range.
• Control timing: Once per minute after 3 minutes have passed since the compressor started.
• Opening pulse range: The following range is specified according to the compressor operating frequency.
<table>
<tr><th rowspan="2">Compressor frequency</th><th>Opening pulse range (Lower limit to upper limit)</th></tr>
<tr><th>PUHZ-RP8, 10YHA</th></tr>
<tr><td>49Hz or less</td><td>110~ 300</td></tr>
<tr><td>50Hz to 75Hz</td><td>110~350</td></tr>
<tr><td>76Hz to 90Hz</td><td>120~400</td></tr>
<tr><td>91Hz or more</td><td>120~460</td></tr>
</table>
• Opening pulse range corresponding to the change of compressor operating frequency
Opening pulse range = Amount of frequency change × 2.5 pulse
• Opening pulse range corresponding to the SC setting : Max. ± 9 pulse
• Compressor start-up
Opening pulse will be adjusted according to only the change of frequency during 3 minute start-up.
5-3.Target SC correction by discharge temperature (TH4)
The target SC is corrected according to the discharge temperature.
• Range of discharge temperature (TH4) correction : 100℃~ 105℃
• Range of correction in step of target SC : - 1~ 0
5-4.Target SC correction by discharge super heat
The target SC is corrected according to the discharge super heat.
• Range of discharge super heat correction : 10℃~15℃
• Range of correction in step of target SC : 0~ +1
5-5.Lower opening correction by discharge temperature (TH4)
The lower opening of LEV is corrected according to the discharge temperature (TH4).
• Range of discharge temperature (TH4) correction : 115℃ or more
• Amount of correction of lower opening : +10pulse (every minute, Max.+30 Pulse)
5-6.Lower opening correction by discharge super heat
• Range of discharge super heat correction : 50℃ or more
• Amount of correction of lower opening : +10pulse (every minute, Max. +100 Pulse)
5-7. Others
① LEV opening pulse is set to 400 while the compressor is being stopped.
② After LEV opening pulse is initialized to 0 by making 700 pulse down from the present pulse, set the pulse to 400.
</td><td>Discharge super heat temp. is calculated from discharge temp. (TH4) and outdoor cond./eva. temp. (TH6).</td></tr>
</table>

6. Four way valve	6-1. Normal control Always OFF during normal operation.	
	6-2. Change of Operation mode When the mode changes from HEAT to COOL:  	

8-2. HEAT OPERATION

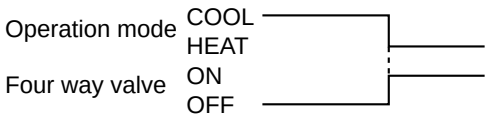
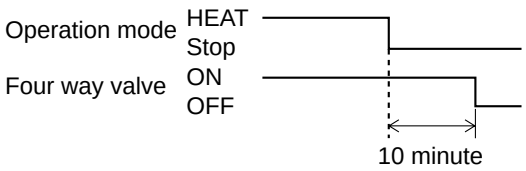
<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>
1-1. Thermoregulating function
The outdoor unit receives information of set temperature and intake temperature from the indoor unit through transmission and judges the compressor ON/OFF controlled by thermoregulating from their temperature difference. However, the compressor does not stop when the indoor unit is in the hot adjuster mode even though the information tells the need to turn off the compressor.
</td><td>Refer to “INDOOR UNIT CONTROL” for the detailed detection method.</td></tr>
<tr><td></td><td>
1-2. Normal control
• Control timing: Once per minute after 3 minutes have passed since the compressor started.
• Frequency changing range: -12Hz to +20Hz ※1
※1. However, in the following cases, the frequency changing amount, which is different from the normal one, will be applied to control the operating frequency.
(1) Frequency is fixed to the minimum just before the compressor is stopped by the thermoregulating function.
Intake temperature ≧ Set temperature - 0.5℃ … Fixed to the minimum frequency.
Intake temperature ≦ Set temperature - 1.0℃ … Fixation is released. (Returned to normal control.)
(2) Correction of the frequency changing amount according to the estimated discharge temp.
If the estimated discharge temperature is more than 113℃, the frequency changing amount will be corrected.
• Correction amount: 0Hz to -6Hz
(3) Frequency control after the defrosting operation
After the defrosting operation is finished, the compressor will be stopped for 1 minute and then get restarted.
</td><td></td></tr>
<tr><td></td><td>
1-3. Start-up control
Controls, which are conducted in 3 minutes after the compressor gets started, are categorized according to the outside temperature(TH7) as shown below.
<table>
<tr><th rowspan="2">Outside temp.</th><th colspan="2">Start-up pattern</th><th rowspan="2">Defrosting restore start-up</th></tr>
<tr><th>Initial start-up</th><th>Restart</th></tr>
<tr><td>TH7 < 0℃</td><td>(A), (D)</td><td>(B), (D)</td><td>(A), (D)</td></tr>
<tr><td>0℃ ≦ TH7 < 12℃</td><td>(A)</td><td>(B)</td><td>(A)</td></tr>
<tr><td>TH7 ≧ 12℃</td><td>(C)</td><td>(C)</td><td>(A)</td></tr>
</table>
(1) In case of pattern (A)
a. 0 min. to 1 min. after start-up: Fixed to 48Hz.
b. 1 min. to 3 min. after start-up: Fixed to the Hz which has been regulated according to the temp. difference between intake temp. and set temp.
• Fixed frequency: minimum Hz to 48Hz.
(2) In case of pattern (B)
a. 0 min. to 1 min. after start-up: Fixed to the minimum Hz.
b. 1 min. to 3 min. after start-up: Fixed to the Hz which has been regulated according to the temp. difference between intake temp. and set temp.
• Fixed frequency: minimum Hz or 42Hz.
(3) In case of pattern (C)
a. 0 min. to 3 min. after start-up: Fixed to the minimum Hz.
(4) In case of pattern (D)
a. 0 min. to 1 min. after start-up: Fixed to 70Hz.
b. 1 min. to 3 min. after start-up: Fixed to the 63 or 70 Hz which has been regulated according to the temp. difference between intake temp. and set temp.
Maximum Hz will be limited to 70Hz for 10 minutes after the start-up of compressor.
</td><td>Start-up pattern when TH7 < 0℃
RP1.6, 2····(A)
RP4-10·····(A)
RP2.5, 3····(D)</td></tr>
<tr><td></td><td>
1-4. Discharge temperature over-rise prevention control
The same control as that of COOL operation.
</td><td></td></tr>
<tr><td></td><td>
1-5. Condensing temperature over-rise prevention control
Frequency controls such as Hz-down and no more Hz-up will be conducted according to the indoor cond./eva. temperature (TH5).
<table>
<tr><th>Temperature restriction (TH5)</th><th>RP1.6~ 2</th><th>RP2.5~ 6</th><th>RP8, 10</th></tr>
<tr><td>No more Hz-up</td><td>53℃</td><td>51℃</td><td>53℃</td></tr>
<tr><td>Hz down (-5 Hz per min.).</td><td>58℃</td><td>56℃</td><td>56℃</td></tr>
<tr><td>Hz down (-10 Hz per min.).</td><td>63℃</td><td>61℃</td><td>59℃</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>2. Fan</td><td>2-1. Normal control
Fan rotation times (rpm) will be controlled according to the outdoor outside temperature (TH7).
• Control method: Inverter control
• Rotation times: Fan step (N) = 0, 9 and 10
 
</td><td>Step (N)—Rotation times(rpm)
<table><tr><th rowspan="2">Step (N)</th><th colspan="3">Rotation times(rpm)</th></tr><tr><th>RP1.6, 2</th><th>RP2.5, 3</th><th>RP4-6</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>105</td><td>95</td><td>125</td></tr><tr><td>2</td><td>135</td><td>115</td><td>155</td></tr><tr><td>3</td><td>165</td><td>135</td><td>175</td></tr><tr><td>4</td><td>205</td><td>165</td><td>200</td></tr><tr><td>5</td><td>265</td><td>200</td><td>240</td></tr><tr><td>6</td><td>340</td><td>245</td><td>285</td></tr><tr><td>7</td><td>430</td><td>305</td><td>360</td></tr><tr><td>8</td><td>530</td><td>450</td><td>465</td></tr><tr><td>9</td><td>680</td><td>700</td><td>700</td></tr><tr><td>10</td><td>700</td><td>720</td><td>720</td></tr></table>
<table><tr><th rowspan="2">Step (N)</th><th>Rotation times (rpm)</th></tr><tr><th>RP8, 10</th></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>60</td></tr><tr><td>2</td><td>80</td></tr><tr><td>3</td><td>100</td></tr><tr><td>4</td><td>120</td></tr><tr><td>5</td><td>160</td></tr><tr><td>6</td><td>220</td></tr><tr><td>7</td><td>320</td></tr><tr><td>8</td><td>440</td></tr></table>
<table><tr><th rowspan="2">Step (N)</th><th colspan="4">Rotation times (rpm)RP8, 10</th></tr><tr><th colspan="4">Compressor frequency(Hz)</th></tr><tr><th>~58</th><th>59~68</th><th>69~76</th><th>77~82</th></tr><tr><td>9</td><td>600</td><td>600</td><td>650</td><td>700</td></tr><tr><td>10</td><td>700</td><td>700</td><td>700</td><td>700</td></tr></table></td></tr>
<tr><td></td><td>2-2. Start-up control in HEAT operation at low outside temperature (RP2.5,3 only)
[Requirement] All of following conditions should be satisfied.
a. The first start-up after the power has been reset, or the start-up in HEAT mode after 30 minutes have passed since the compressor stopped.
b. Outside temperature (TH7) ≦ 0℃
[Control details]
Fan step will be set to 0 (N = 0) for 2 minutes after the start-up of compressor.
Start-up control will turn into the normal control after the 2-minute operation of compressor.</td><td><table><tr><th rowspan="2">Step (N)</th><th colspan="4">Rotation times (rpm)RP8, 10</th></tr><tr><th colspan="4">Compressor frequency(Hz)</th></tr><tr><th></th><th>83~89</th><th>90~98</th><th>99~</th></tr><tr><td>9</td><td>550</td><td>600</td><td>600</td></tr><tr><td>10</td><td>750</td><td>600</td><td>700</td></tr></table></td></tr>
<tr><td></td><td>2-3. Others
(1) Fan also stops when the compressor is being stopped. (Fan step = 0) However, fan step will be set to 10 while the compressor is being stopped due to the abnormal heat sink temperature (Error code = U5). At that time, the compressor is just waiting for 3 minutes to restart.
(2) In case of RP3, fan is being stopped for 2 minutes after the start-up of compressor in HEAT mode at low outside tempereture (Fan step = 0)</td><td></td></tr>
<tr><td>3. Bypass valve control (RP2.5, 3 only)</td><td>3-1. Normal control
Start-up control in HEAT operation
[Bypass valve ON/OFF]
ON for 3 minutes after the compressor gets started operating.</td><td></td></tr>
</table>

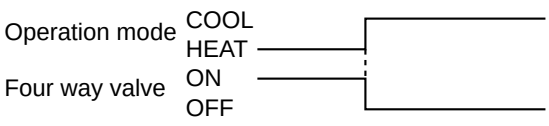
<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>4. LEV(A)
RP1.6~ 6</td><td>4-1. Normal control
LEV opening pulse will be controlled every minute to adjust the discharge temperature in order to let the intake super heat temperature be 0℃ to 5℃.
• Control timing: Once per minute after 3 or 7 minutes have passed since the compressor started.
• Opening pulse range: The following range is specified according to the compressor operating frequency.
<table>
<tr><th rowspan="2">Compressor frequency</th><th colspan="3">Opening pulse range (Lower limit to upper limit)</th></tr>
<tr><th>PUHZ-RP1.6, 2VHA</th><th>PUHZ-RP2.5, 3VHA</th><th>PUHZ-RP4,5,6VHA/YHA</th></tr>
<tr><td>49Hz or less</td><td>55 ~ 250</td><td>80 ~ 250</td><td>70 ~ 300</td></tr>
<tr><td>50Hz to 75Hz</td><td>85 ~ 350</td><td>95 ~ 350</td><td>90 ~ 350</td></tr>
<tr><td>76Hz to 90Hz</td><td>100 ~ 400</td><td>130 ~ 400</td><td>100 ~ 400</td></tr>
<tr><td>91Hz to more</td><td>125 ~ 480</td><td>130 ~ 480</td><td>120 ~ 480</td></tr>
</table>
• Opening pulse range corresponding to the change of compressor operating frequency
Opening pulse range = Present opening pulse × (Target frequency / Operating frequency -1) × 0.8
• Compressor start-up
Opening pulse will be adjusted according to only the change of frequency during 3 or 7 minute start-up.
The start-up control time will be changed according to the discharge temperature (TH4).
Discharge temperature (TH4) ≧ 30℃ : 3 minute start-up
Discharge temperature (TH4) < 30℃ : 7 minute start-up</td><td></td></tr>
<tr><td></td><td>4-2. Low discharge super heat temperature protection control
Set a small value for the targeted opening pulse according to the discharge super heat temperature.
• Correction range of the discharge super heat temperature : 10℃ or less
• This control does not work for 3 or 7 minutes after the compressor gets started.</td><td>Discharge super heat temp. is calculated from discharge temp. (TH4) and outdoor cond./eva. temp. (TH6).</td></tr>
<tr><td></td><td>4-3. Evaporation protection control
20 pulse will be added to the present opening pulse in the condition written below.
Outdoor condenser/evaporator temperature (TH6) - Outdoor liquid pipe temperature (TH3) ≧ 6℃
※ This control does not work for 3 or 7 minutes after the compressor gets started.</td><td></td></tr>
<tr><td></td><td>4-4. Others
① LEV opening pulse is set to 400 while the compressor is being stopped.
② After LEV opening pulse is initialized to 400 by making 700 pulse down from the present pulse, set the pulse to 400.</td><td></td></tr>
</table>

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>5. LEV(B)
RP1.6~ 6</td><td>
5-1. Normal control
Opening pulse will vary among steps (1 to 3) according to air conditioner's operating status.
• Control timing: Once every 5 minutes after 3 or 7 minutes have passed since the compressor started.
• LEV opening pulse for each step:
<table>
<tr><th>Step</th><th>RP1.6VHA</th><th>RP2VHA</th><th>RP2.5VHA</th><th>RP3VHA</th><th>RP4VHA</th><th>RP5VHA</th><th>RP6VHA</th><th>RP4VHA1
RP4YHA</th><th>RP5VHA1
RP5YHA</th><th>RP6VHA1
RP6YHA</th></tr>
<tr><td>1</td><td>150</td><td>170</td><td>150</td><td>200</td><td>180</td><td>180</td><td>185</td><td>180</td><td>180</td><td>185</td></tr>
<tr><td>2</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td><td>240</td><td>240</td><td>240</td></tr>
<tr><td>3</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td></tr>
</table>
• Start-up step
The step is set to 2 when the compressor starts up.
• Requirement for step-up
LEV opening pulse will step up when any of following conditions is satisfied.
(1) The discharge temp. (TH4) is 100℃ or more
(2) The outdoor condenser/evaporator temperature (TH6) is 57℃ or more
(3) The discharge super heat temperature is 50℃ or more
Super heat temperature = Discharge temperature (TH4) - Outdoor condenser/evaporator temperature (TH6)
(4) The sub cool temperature is 12℃ or more
Sub cool temperature = Outdoor condenser/evaporator temperature (TH6) - Outdoor liquid pipe temperature (TH3)
• Requirement for step-down
LEV opening pulse will step down when any of following conditions are satisfied and above step-up conditions are not satisfied.
(1) The discharge temperature (TH4) is 90℃ or less
(2) The outdoor condenser/evaporator temperature (TH6) is 52℃ or less
(3) The discharge super heat temperature is 40℃ or less
Super heat temperature = Discharge temperature (TH4) - Outdoor condenser/evaporator temperature (TH6)
(4) the sub cool temperature is 3℃ or less
Sub cool temperature = Outdoor condenser/evaporator temperature (TH6) - Outdoor liquid pipe temperature (TH3)
• The step does not change if neither step-up conditions nor step-down conditions are satisfied.
</td><td></td></tr>
<tr><td></td><td>
5-2. Compulsory step-up
When any of the following conditions are satisfied, the step will be forced to 3.
(1) The discharge temperature (TH4) is 110℃ or more.
(2) The condenser/evaporator temperature (TH6) is 62℃ or more.
</td><td></td></tr>
<tr><td></td><td>
5-3. Stop control
When the LEV is being stopped, the step will be set to 3.
</td><td></td></tr>
</table>

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>6. LEV
RP8, 10</td><td>6-1. Target sub cool (SC)
Compressor operating frequency < 60Hz Target SC step = 2
Compressor operating frequency ≧ 60Hz Target SC step = 2</td><td>Refer to 8-1. for the relation between target SC and target SC step.</td></tr>
<tr><td></td><td>6-2. Normal control
LEV opening pulse will be controlled according to the change of compressor operating frequency and regulated to adjust the SC to let the target SC range.
• Control timing: Once per minute after 3 minutes have passed since the compressor started.
• Opening pulse range: The following range is specified according to the compressor operating frequency.
<table><tr><th rowspan="2">Compressor frequency</th><th>Opening pulse range (Lower limit to upper limit)</th></tr><tr><th>PUHZ-RP8, 10YHA</th></tr><tr><td>49Hz or less</td><td>110~ 300</td></tr><tr><td>50Hz to 75Hz</td><td>110~350</td></tr><tr><td>76Hz to 90Hz</td><td>120~400</td></tr><tr><td>91Hz or more</td><td>120~460</td></tr></table>• Opening pulse range corresponding to the change of compressor operating frequency
Opening pulse range = Amount of frequency change × 2.5 pulse
• Opening pulse range corresponding to the SC setting : Max. ± 9 pulse
• Compressor start-up
Opening pulse will be adjusted according to only the change of frequency during 3 minute start-up. However, when the outdoor temperature is -5℃ or less, LEV opening pulse is fixed to 460 pulse for 1 minute.</td><td>SC is calculated from discharge temp. (TH4) and indoor liquid temp. (TH2).</td></tr>
<tr><td></td><td>6-3.Target SC correction by discharge temperature (TH4)
The target SC is corrected according to the discharge temperature.
• Range of discharge temperature (TH4) correction : 100℃~105℃
• Range of correction in step of target SC : - 1~0</td><td></td></tr>
<tr><td></td><td>6-4.Target SC correction by discharge super heat
The target SC is corrected according to the discharge super heat.
• Range of discharge super heat correction : 10℃~15℃
• Range of correction in step of target SC : 0~+1</td><td>Discharge super heat temp. is calculated from discharge temp. (TH4) and indoor cond./eva. temp. (TH5).</td></tr>
<tr><td></td><td>6-5.Lower opening correction by discharge temperature (TH4)
The lower opening of LEV is corrected according to the discharge temperature (TH4).
• Range of discharge temperature (TH4) correction : 115℃ or more
• Amount of correction of lower opening : +10pulse (every minute, Max.+30 Pulse)</td><td></td></tr>
<tr><td></td><td>6-6.Lower opening correction by discharge super heat
• Range of discharge super heat correction : 50℃ or more
• Amount of correction of lower opening : +10pulse (every minute, Max. +100 Pulse)</td><td></td></tr>
<tr><td></td><td>6-7. Others
① LEV opening pulse is set to 400 while the compressor is being stopped.
② After LEV opening pulse is initialized to 0 by making 700 pulse down from the present pulse, set the pulse to 400.</td><td></td></tr>
</table>

Control modes	Control details	Remarks
7. Four way valve	7-1. Normal control Always OFF during normal operation.	
	7-2. Change of Operation mode • When the mode changes from HEAT to COOL:  • When the operation stops in HEAT mode:  	
	7-3. Start-up control in HEAT operation at low outside temperature (RP2.5, 3 only) [Requirement] Same as the explanation in fan control. [Control details] OFF for 2 minutes after the start-up of compressor, but ON if 2 minutes pass.	
	7-4. In the defrosting operation Always OFF during the defrosting operation	

8-3. DRY OPERATION

Control modes	Control details	Remarks
1. Compressor	1-1. Thermoregulating function The outdoor unit receives information of set temp. and intake temp. from the indoor unit through transmission and judges the compressor ON/OFF with thermoregulating function from their temperature difference.	Refer to "INDOOR UNIT CONTROL" for ON/OFF judgment method
	1-2. Normal control Same control as that of COOL operation.	
	1-3. Start-up control Same control as that of COOL operation.	
	1-4. Indoor anti-freezing control Not available	
	1-5. Outdoor frozen prevention control Same control as that of COOL operation	
	1-6. Discharge temperature over-rise prevention control Same control as that of COOL operation	
	1-7. Condensing temperature over-rise prevention control Same control as that of COOL operation	
	1-8. Heat sink temperature over-rise prevention control Same control as that of COOL operation.	
	1-9. Others Same control as that of COOL operation.	
2. Fan	2-1. Normal control Fan rotation times (rpm) will be controlled according to the outdoor outside temp. (TH7). • Control method: Inverter control • Rotation times: Fan step (N) = 0 and 2 to 10 • Comp. Start-up: Fan step is fixed to 9 for 30 seconds after the start-up of compressor.	
	2-2. Correction of fan step according to the outdoor cond./eva. temperature Fan step will be corrected according to the outdoor cond./eva. temperature (TH6). • Correction range of condensing temperature : 30℃ to 53℃ • Correction range of fan step: -1 to +3	
	2-3. Correction of fan step according to the heat sink temperature Fan step will be corrected according to the heat sink temperature (TH8) • Correction range of heat sink temperature: 68℃ to 78℃ • Correction range of fan step: 0 to +2	
	2-4. Others Fan also stops when the compressor is being stopped. (Fan step = 0.) However, fan step will be set to 10 while the compressor is being stopped due to the abnormal heat sink temperature (Error code = U5). At this time, the compressor is just waiting 3 minutes to restart.	
3. LEV	Same control as that of COOL operation.	
4. Four way valve	4-1. During normal operation Always OFF during normal operation.	
	4-2. Operation mode change When the mode changes from HEAT to COOL;  	

8-4. FAN OPERATION

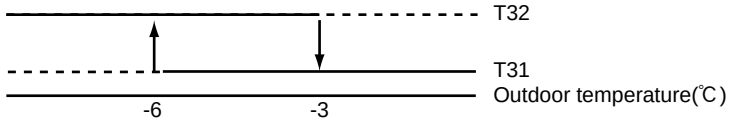
Control modes	Control details	Remarks
1. Compressor	Always OFF	
2. Fan	Always OFF	
3. Four way valve	Always OFF	

8-5. DEFROSTING OPERATION

Control modes	Control details	Remarks
1. Start	1-1. Requirements for starting Defrosting starts when either of below conditions is satisfied. (Conditions) a. In HEAT operation and when the outdoor liquid pipe temp.(TH3) continues to be -2℃ or less for 7 minutes after the compressor integrating operation time fulfils defrosting prohibition time (T1 ※). b. In HEAT operation and when the outdoor liquid pipe temp.(TH3) continues to be -5℃ or less for 7 minutes after the compressor integrating operation time fulfils defrosting prohibition time (T3 ※). c. In HEAT operation and when the outdoor liquid pipe temp.(TH3) continues to be -2℃ or less for 3 minutes after the compressor integrating operation time fulfils the defrosting prohibition time (T1 ※) and the compressor stops twice within 10 minutes from its start-up. d. In HEAT operation and when the outdoor liquid pipe temp.(TH3) continues to be -5℃ or less for 3 minutes after the compressor integrating operation time fulfils the defrosting prohibition time (T3 ※) and the compressor stops twice within 10 minutes from its start-up. (Complementary explanation) The (a) indicates the defrosting operation with the frost amount light. The (b) indicates the defrosting operation with the frost amount heavy The (c) indicates the defrosting operation in case the thermostat is turned on/off frequently because the frost amount is small and the air-conditioning load is heavy. The (d) indicates the defrosting operation in case the thermostat is turned on/off frequently because the frost amount is large and the air-conditioning load is light.	※ Refer to the table of “Defrosting prohibition time” on this page. Defrosting operation frequency Model name / Frequency PUHZ-RP1.6VHA 80Hz PUHZ-RP2VHA 80Hz PUHZ-RP2.5VHA 80Hz PUHZ-RP3VHA 80Hz PUHZ-RP4VHA 80Hz PUHZ-RP5VHA 80Hz PUHZ-RP6VHA 80Hz PUHZ-RP4YHA 80Hz PUHZ-RP5YHA 80Hz PUHZ-RP6YHA 80Hz PUHZ-RP8YHA 85Hz PUHZ-RP10YHA 85Hz
	1-2. Actuator at the beginning of defrosting operation Actuator will be activated by the following procedure if any of the above conditions is detected. ① Compressor operating frequency will get down to 30Hz. ② When the compressor operating frequency becomes 30Hz; • Four way valve will be turned off. • Outdoor fan will be stopped. • Both LEV A and B opening pulse are set to 480. After ① and ② are completed, the compressor will be set to the defrosting operation frequency.	
2. Stop	2-1. Requirements for ending Defrosting stops when any of the following conditions is satisfied. (Conditions) a. 15 minutes have passed since the defrosting operation started. b. The outdoor liquid pipe temperature (TH3) has become 20℃ or more within 2 minutes from the start of defrosting operation. c. The outdoor liquid pipe temperature (TH3) has become 8℃ or more after the defrosting operation is conducted for 2 minutes. d. During defrosting operation, the compressor has been stopped due to errors or something. e. During defrosting operation, the operation mode except HEAT has been selected by remote controller.	

Continued to the next page.

From the previous page.

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>2. Stop</td><td>2-2. Actuator at the end of defrosting operation
Actuator will be activated by the following procedure if any of the above conditions except d & e is detected.
① Start the outdoor fan.
② Let the compressor operation frequency down to 30Hz from the defrosting operation frequency.
③ Stop the compressor for 1 minute when the compressor operation frequency becomes 30Hz.
After ① to ③ are completed, set the compressor operation frequency to the normal (start-up pattern A).</td><td></td></tr>
<tr><td>3. Defrosting prohibition time</td><td>Defrosting prohibition time (T1 and T31/T32) are decided by the previous defrosting operation time (t2).
• Prohibition time table for ordinary region
<table>
<tr><th rowspan="2">Previous operation time</th><th colspan="2">Prohibition time</th></tr>
<tr><th>T1</th><th>T31/ T32</th></tr>
<tr><td>t2 ≦ 3 minutes</td><td>100 minutes</td><td>30 minutes/ 60 minutes</td></tr>
<tr><td>3 < t2 ≦ 7 minutes</td><td>60 minutes</td><td>20 minutes/ 50 minutes</td></tr>
<tr><td>7 < t2 ≦ 10 minutes</td><td>50 minutes</td><td>20 minutes/ 20 minutes</td></tr>
<tr><td>10 < t2 ≦ 15 minutes</td><td>30 minutes</td><td>20 minutes/ 20 minutes</td></tr>
<tr><td>t2 = 15 minutes</td><td>20 minutes</td><td>20 minutes/ 20 minutes</td></tr>
</table>
• Prohibition time table for high humidity region
<table>
<tr><th rowspan="2">Previous operation time</th><th colspan="2">Prohibition time</th></tr>
<tr><th>T1</th><th>T31/ T32</th></tr>
<tr><td>t2 ≦ 7 minutes</td><td>50 minutes</td><td>20 minutes</td></tr>
<tr><td>7 < t2 ≦ 15 minutes</td><td>20 minutes</td><td>20 minutes</td></tr>
</table>
• Others
<table>
<tr><th rowspan="2">Previous operation time</th><th colspan="2">Prohibition time</th></tr>
<tr><th>T1</th><th>T3</th></tr>
<tr><td>Operation mode has been changed to the other mode except HEAT during defrosting operation.</td><td>40 minutes</td><td>40 minutes</td></tr>
<tr><td>Protection devices have worked during defrosting operation.</td><td>10 minutes</td><td>10 minutes</td></tr>
<tr><td>Initial prohibition time when power is reset.</td><td>40 minutes</td><td>40 minutes</td></tr>
</table>

</td><td></td></tr>
<tr><td>4. Forced defrosting</td><td>4-1. Requirements for starting
Compulsory defrosting operation will be conducted if all items below are satisfied when SW1-1 (OFF ➜ ON) is detected during HEAT operation.
(Conditions)
a. The compressor is operating.
b. 10 minutes have passed since the compressor started or the last defrosting operation was conducted.
c. The outdoor liquid pipe temperature is less than 8℃.
4-2. Requirements for ending
Same conditions as the above ending conditions of normal defrosting</td><td></td></tr>
</table>

8-6. AUTO OPERATION

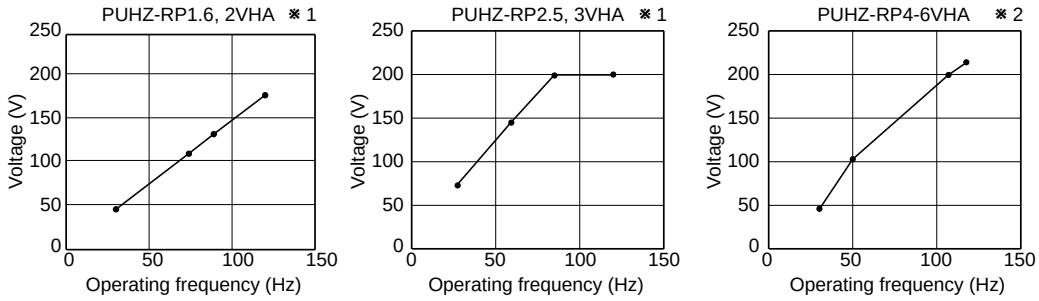
Control modes	Control details	Remarks
1. Initial operation mode	When a operation mode turns into AUTO operation; ① HEAT mode will be operated if intake temperature < set temperature ② COOL mode will be operated if intake temperature ≧ set temperature	
2. Change of operation mode	① HEAT mode will turn into COOL mode when intake temperature ≧ set temperature + 2deg and 15 minutes have passed since the HEAT operation started. ② COOL mode will turn into HEAT mode when intake temperature ≦ set temperature – 2deg and 15 minutes have passed since the COOL operation started.	
3. COOL mode	Same controls as those of COOL operation.	
4. HEAT mode	Same controls as those of HEAT and defrosting operation.	

8-7. INVERTER CONTROL

Control modes	Control details
1. Basic control	1-1. Frequency setting

		min	PLA-RP•AA		PCA-RP•GA		PKA-RP•GAL		PKA-RP•FAL		PEA-RP•EA		PEAD-RP•EA		PEAD-RP•GA	
			Rated	max	Rated	max	Rated	max	Rated	max	Rated	max	Rated	max	Rated	max
PUHZ-	COOL	22	49	66	-	-	49	76	-	-	-	-	53	70	-	-
RP1.6VHA	HEAT	22	52	77	-	-	57	80	-	-	-	-	62	80	-	-
PUHZ-	COOL	30	66	82	74	85	74	85	-	-	-	-	67	85	-	-
RP2VHA	HEAT	30	74	106	77	106	61	106	-	-	-	-	82	106	-	-
PUHZ-	COOL	32	47	54	47	55	-	-	46	54	-	-	51	58	51	58
RP2.5VHA	HEAT	32	51	67	51	67	-	-	51	67	-	-	57	67	57	67
PUHZ-	COOL	32	55	70	59	69	-	-	55	67	59	72	55	72	55	72
RP3VHA	HEAT	32	61	87	58	85	-	-	58	84	57	84	65	92	65	92
PUHZ-	COOL	30	49	62	53	69	-	-	54	67	53	65	54	66	54	66
RP4VHA/YHA	HEAT	30	55	81	55	78	-	-	55	79	53	74	54	74	54	74
PUHZ-	COOL	30	68	86	70	85	-	-	-	-	72	88	59	78	-	-
RP5VHA/YHA	HEAT	30	68	87	68	87	-	-	-	-	63	82	71	87	-	-
PUHZ-	COOL	30	85	96	82	96	-	-	-	-	76	96	79	96	-	-
RP6VHA/YHA	HEAT	30	80	97	77	94	-	-	-	-	70	85	79	92	-	-
PUHZ-	COOL	31	80	95	81	95	-	-	81	95	79	95	81	95	81	95
RP8YHA	HEAT	31	84	91	84	91	-	-	84	91	82	91	81	91	81	91
PUHZ-	COOL	31	91	118	92	118	-	-	-	-	95	118	91	118	-	-
RP10YHA	HEAT	31	106	116	106	116	-	-	-	-	104	116	103	116	-	-

1-2. V/F pattern

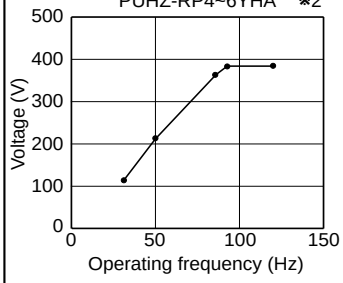


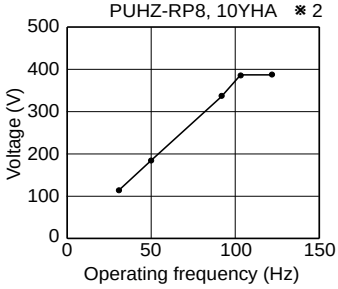
※1. Actual performance does not exactly match the V/F line on both graphic charts due to the air-conditioning load because the inverter control is based on vector.

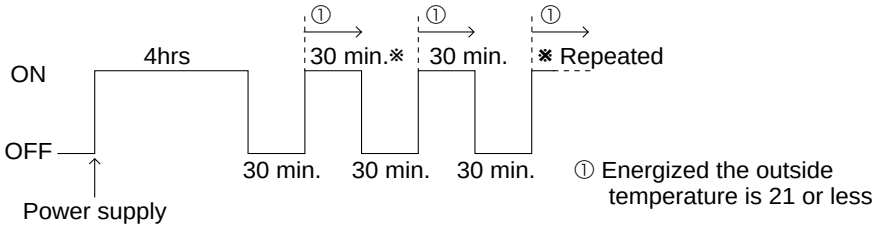
※2. Actual values of V/F will be almost the same as the V/F line on the graphic chart because the inverter control is based on voltage and frequency. However, they may not exactly match the V/F line on the graphic chart because voltage correction control makes an effect on the performance.

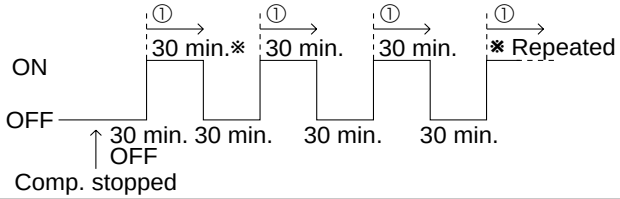
Continued to the next page.

From the previous page.

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td></td><td>
PUHZ-RP4~6YHA ※2


PUHZ-RP8, 10YHA ※2


※2. Actual values of V/F will be almost the same as the V/F line on the graphic chart because the inverter control is based on voltage and frequency. However, they may not exactly match the V/F line on the graphic chart because voltage correction control makes an effect on the performance.
</td><td></td></tr>
<tr><td>2. Frequency</td><td>2-1. Frequency is restricted by the compressor electrical current (CT1).
Frequency control such as Hz-down and no more Hz-up will be conducted according to the compressor electrical current (CT1).
<table>
<tr><th>Models</th><th>No more Hz-up</th><th>Hz-down</th></tr>
<tr><td>PUHZ-RP1.6, 2, 2.5, 3VHA</td><td>12.5 A</td><td>13 A</td></tr>
<tr><td>PUHZ-RP4~6VHA</td><td>24.5A</td><td>26A</td></tr>
<tr><td>PUHZ-RP4~6YHA</td><td>12.6 A</td><td>14 A</td></tr>
<tr><td>PUHZ-RP8, 10YHA</td><td>20.9A</td><td>22.6A</td></tr>
</table>
</td><td>※ Hz-down amount: -5Hz per minute</td></tr>
<tr><td>3. Voltage correction</td><td>3-1. Voltage is corrected by bus voltage.
Inverter voltage will be corrected by dc bus voltage.
Even though the power supply voltage varies within ±10%, the voltage should be corrected in order to make the output voltage of inverter stable.</td><td></td></tr>
<tr><td></td><td>3-2. Voltage correction by compressor's electric current (CT1). (PUHZ-RP4 to 6V only)
Output voltage of inverter is corrected by compressor's electric current (CT1).
<table>
<tr><th>Models</th><th>Correction of starting current [A]</th><th>Correction of max current [A]</th></tr>
<tr><td>PUHZ-RP4~6VHA</td><td>16</td><td>24</td></tr>
<tr><td>PUHZ-RP4~6YHA</td><td>8</td><td>13</td></tr>
<tr><td>PUHZ-RP8, 10YHA</td><td>15</td><td>20</td></tr>
</table>
</td><td></td></tr>
<tr><td>4. Power supply to locked compressor</td><td>4-1. Compressor energizing method
• Compressor ON/OFF pattern when power is supplied;


• Compressor ON/OFF pattern when power is cut off;


</td><td>"08" will be displayed on the LED1 of "A-Control Service Tool" while power is supplied to the compressor.

※ Outdoor temp. ≦ 21℃

Outdoor temp. >21℃
Cycle :
15 min. ON
30 min. OFF</td></tr>
<tr><td>5. 52C</td><td>ON/OFF method
52C will turn ON/OFF in the following conditions.
• 52C turns ON when power is supplied, and remains ON regardless of the compressor's ON/OFF.
• 52C turns OFF when power is cut off.</td><td></td></tr>
</table>

8-8. REPLACEMENT OPERATION (RP4 to 6 Only)

Control modes	Control details	Remarks
1. Start and end of replacement operation	1-1. Requirements for starting Replacement operation will start when SW8-2 on the outdoor controller board is turned on while units are being stopped.	
	1-2. Requirements for ending Replacement operation will end if any of the following conditions is satisfied. a. 2 hours have passed since replacement operation started. b. SW8-2 has been turned off. c. Operation (COOL / DRY / HEAT) has been started and controlled by remote controller.	※ Normal air conditioning can be operated even if SW8-2 remains ON after the replacement operation is finished.
2. During replacement operation	2-1. Normal control In COOL operation replacement operation will be conducted by opening the replacement filter circuit in order to circulate refrigerant. • Compressor control The same continuous operation as COOL operation regardless of intake temperature. • LEV(A)control Always closed. • LEV(B)control The same control as that of COOL operation. • Fan control The same control as that of COOL operation. • Four way valve control The same control as that of COOL operation. (Always OFF.) • Solenoid valve Always opened. • Others LED on the outdoor controller circuit board comes ON/OFF per second during replacement operation.	※ Cold air comes out of indoor unit because the replacement operation is conducted in COOL operation.
	2-2. Indoor frozen prevention control The compressor will be stopped for 3 minutes if the indoor liquid pipe temperature (TH2) or indoor condenser/evaporator temperature (TH5) is 3℃ or less after 10 minutes have passed since the compressor started.	※ Frozen protection control may be activated when the indoor intake temp. is 15℃ or less.

8-9. REPLACEMENT OPERATION (RP8, 10 Only)

Control modes	Control details	Remarks
1. Start and end of automatic replacement operation	1-1. Requirements for starting Bypass valve is on when compressor is operating and the automatic replacement operation starts.	
	1-2. Requirements for ending Replacement operation will end if any of the following condition is satisfied. When bypass valve ON adjusting time passes 50 hours.	※ When SW8-2 OFF → ON, bypass valve ON adjusting is reset
2. During replacement operation	2-1. Normal control Replacement operation will be conducted by opening the replacement filter circuit in order to circulate refrigerant. • Compressor control Normal control • LEV control Normal control • Fan control Normal control • Four way valve control Normal control • Solenoid valve Always opened.	

8-10. REFRIGERANT COLLECTING (pump down)

Control modes	Control details	Remarks
1. Start and end of pump down operation	1-1. Requirements for starting Pump down operation will be conducted when SWP on the outdoor controller board is turned on while the unit is being stopped.	
	1-2. Requirements for ending Pump down operation will end if any of the following conditions is satisfied. a. Low pressure switch has been used. b. 3 minutes have passed since the pump down operation started. c. Operation has been stopped by remote controller or changed to the other mode except COOL. d. Error has been detected.	※ Low pressure switch mentioned in (a) is equipped in RP4 to 10 only.
2. During pump down operation	2-1. Following controls are activated during pump down operation. • Compressor control The same continuous operation as COOL operation regardless of intake temperature. • LEV(A) control (RP1.6~ 6 only) Opening pulse is fixed to step 3 (480 pulse). • LEV(B) control Completely closed (0 pulse). • Fan control Fan step is fixed to step 10. • Four way valve OFF in COOL operation.	
<Complementary explanation for above 2 controls>	① Pump down operation is considered to be finished normally when the ending condition (a) or (b) is satisfied. At this time, the outdoor controller board's LED1 (green) turns OFF and LED2 (red) turns ON. The units cannot be operated until the power is reset. (To prevent the units from operating with pump down operation.) ② If the pump down operation ends due to the ending conditions (c) or (d), the unit will be in a state of normal stop.	To prevent the unit from operating with pump down operation.

9 DIP SWITCH FUNCTION

9-1. INDOOR UNIT

DIP switch and jumper connector functions.
Each function is controlled by the jumper connector in the control p.c.board. Below table shows that the function setting by the jumper connector is available or not in the control p.c.board of applicable units. Also J11~15 (SW1) and J21~24 (SW2) has Dip switch with their jumper connector.

	INDOOR CONTROLLER BOARD	
	type A	type B
Applicable units	PLA-RP • AA PLA-RP •AA.UK PKA -RP •GAL PKA-RP •FAL PCA-RP •GA	PEA-RP • EA.TH-A PEAD-RP • EA.UK PEAD-RP •GA.UK
J11~J15 (SW1) ; Model setting	○	○
J21~J24 (SW2) ; Capacity setting	○	○

○ : Changeable function
× : Not changeable function

Functions and signification of the jumper connector (Dip switch)

J11~J15 (SW1) — Model settings

type A

J11	J12	J13	J14	J15	Model
○	○	○	○	×	PLA-RP • AA
×	○	×	×	×	PCA-RP • GA
○	○	×	○	×	PKA-RP • GAL
○	×	×	×	×	PKA-RP • FAL

type B

J11	J12	J13	J14	J15	Models
○	×	×	×	○	PEA-RP • EA
×	○	×	×	×	PEAD-RP • EA
×	○	×	×	×	PEAD-RP • GA

J21~J24 (SW2) — Capacity settings

J21	J22	J23	J24	Models						
○	○	×	×	PLA-RP1.6AA		PKA-RP1.6GAL			PEAD-RP1.6EA	
○	×	○	×	PLA-RP2AA	PCA-RP2GA	PKA-RP2GAL			PEAD-RP2EA	
○	○	○	×	PLA-RP2.5AA	PCA-RP2.5GA		PKA-RP2.5FAL		PEAD-RP2.5EA	PEAD-RP2.5GA
○	×	×	○	PLA-RP3AA, AA$_1$	PCA-RP3GA		PKA-RP3FAL	PEA-RP3EA	PEAD-RP3EA,EA$_1$	PEAD-RP3GA
×	×	○	○	PLA-RP4AA, AA$_1$	PCA-RP4GA		PKA-RP4FAL	PEA-RP4EA	PEAD-RP4EA,EA$_1$	PEAD-RP4GA
×	○	○	○	PLA-RP5AA	PCA-RP5GA			PEA-RP5EA	PEAD-RP5EA,EA$_1$	
○	○	○	○	PLA-RP5AA$_1$ PLA-RP6AA, AA$_1$	PCA-RP6GA				PEAD-RP6EA,EA$_1$	

Service PCB

SW2				Models						
1	2	3	4							
ON	ON	OFF	OFF	PLA-RP1.6AA		PKA-RP1.6GAL			PEAD-RP1.6EA	
ON	OFF	ON	OFF	PLA-RP2AA	PCA-RP2GA	PKA-RP2GAL			PEAD-RP2EA	
ON	ON	ON	OFF	PLA-RP2.5AA	PCA-RP2.5GA		PKA-RP2.5FAL		PEAD-RP2.5EA	PEAD-RP2.5GA
ON	OFF	OFF	ON	PLA-RP3AA, AA$_1$	PCA-RP3GA		PKA-RP3FAL	PEA-RP3EA	PEAD-RP3EA,EA$_1$	PEAD-RP3GA
OFF	OFF	ON	ON	PLA-RP4AA, AA$_1$	PCA-RP4GA		PKA-RP4FAL	PEA-RP4EA	PEAD-RP4EA,EA$_1$	PEAD-RP4GA
OFF	ON	ON	ON	PLA-RP5AA	PCA-RP5GA			PEA-RP5EA	PEAD-RP5EA,EA$_1$	
ON	ON	ON	ON	PLA-RP5AA$_1$ PLA-RP6AA, AA$_1$	PCA-RP6GA				PEAD-RP6EA,EA$_1$	

J41 J42 — Pair number setting with wireless remote controller

Control PCB setting		Wireless remote controller setting
J41	J42	
○	○	0
×	○	1
○	×	2
×	×	3 ~ 9

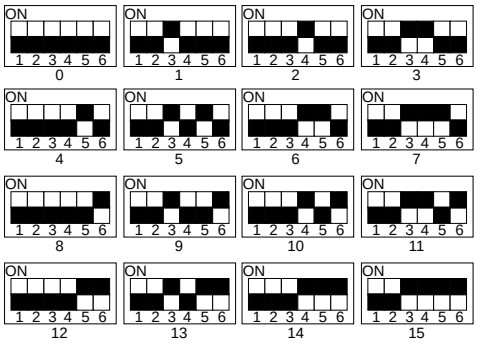
<Settings at time of factory shipment>
Wireless remote controller: 0
Control PCB: ○ (for both J41 and J42)
Four pair number settings are supported.
The pair number settings of the wireless remote controller and indoor control PCB (J41/J42) are given in the table on the left. ('×' in the table indicates the jumper line is disconnected.)

In above table Jumper connector : ○ Short, × Open

Note 1: If the settings of SW1 (model settings) or SW2 (capacity settings) on the service PCB are made incorrectly:
- If the SW1 settings are made incorrectly, the unit will not operate, or won't be able to operate normally.
- The SW1 (model) and SW2 (capacity) settings are used to send the indoor unit's model and capacity information to the outdoor unit. The outdoor unit uses this information to perform control, so the expected performance may not be achieved if the information is incorrect.
- In models with indoor fan phase control, pulsation control or DC fan control, the SW2 (capacity) settings are used to control the fan air volume. If the settings are made incorrectly, the air volume may be higher or lower than expected, performance may drop, or the noise level may increase.

9-2. OUTDOOR UNIT

9-2-1. Function of switches

Type of switch	Switch	No.	Function	Action by the switch operation		Effective timing
				ON	OFF	
Dip switch	SW1	1	Compulsory defrosting	Start	Normal	When compressor is working in heating operation. ※
		2	Abnormal history clear	Clear	Normal	off or operating
		3	Refrigerant address setting			When power supply ON
		4				
		5				
		6				
	SW4	1	Test run	Operating	OFF	Under suspension
		2	Test run mode setting	Heating	Cooling	

Compulsory defrosting should be done as follows.

①Change the DIP SW1-1 on the outdoor controller board from OFF to ON.

②Compulsory defrosting will start by the above operation ① if these conditions written below are satisfied.

- Heat mode setting
- 10 minutes have passed since compressor started operating or previous compulsory defrosting finished.
- Pipe temperature is less than or equal to 8℃.

③Compulsory defrosting will finish if certain conditions are satisfied.

※Compulsory defrosting can be done if above conditions are satisfied when DIP SW1-1 is changed from OFF to ON. After DIP SW1-1 is changed from OFF to ON, there is no problem if DIP SW1-1 is left ON or changed to OFF again. This depends on the service conditions.

Type of Switch	Switch	No.	Function	Action by the switch operation		Effective timing
				ON	OFF	
Dip switch	SW5	1	Frequency setting ※1	Fixed	Normal	During operation (Except 3 minutes after starting.)
		2	Power failure automatic recovery ※2	Auto recovery	No auto recovery	When power supply ON
		3	No function	—	—	—
		4	No function	—	—	—
	SW7 ※4	1	Switch to "Demand function"※3	SW7-1 / SW7-2 / Power consumption when external input: OFF / OFF / 0% (STOP); ON / OFF / 50%; OFF / ON / 70%		Always
		2				
		3	Change of the Hz upper limit in cooling	Limited to 85% of the max Hz in cooling	Normal	Always
		4	Change of the Hz lower limit in heating	Limited to 85% of the max Hz in heating	Normal	Always
		5	Change of the Hz in defrosting	Limited to 85% of the max Hz in defrosting	Normal	Always
		6	Change of the percentage to limit the Hz	Change of the percentage in case of SW7-3,4 (85% → 70%)	Normal	Always
	SW8	1	Use of existing pipe	Used or RP10Y ※5	Not used	Always
		2	Replacement operation	Start	Normal	Under suspension
		3	No function	—	—	—
Push switch	SWP		Pump down	Start	Normal	Under suspension

※ 1. Do not use only SW5-1 to fix the frequency setting. The compressor operating frequency can be fixed to the desired Hz by the combination of the SW5-1 setting and optional parts "A Control Service Tool (PAC-SK52ST)" setting.

※ 2. "Power failure automatic recovery" can be set by either remote controller or this DIP SW. If one of them is set to ON, "Auto recovery" activates. Please set "Auto recovery" basically by remote controller because all units don't have DIP SW. Please refer to mode 01 in the table on page 10. FUNCTION SETTING.

※ 3. SW7-1,2 are used to switch the setting of "Demand function". However, local electrical construction will be required to make use of this mode. Therefore SW7-1, 2 are effective only when the mode is available for the model.

※ 4. Do not use SW7 normally, or troubles may be caused by the units' installed condition and used condition.

※ 5. RP10YHA(-A) is always ON.

Fixing method of the compressor operating frequency

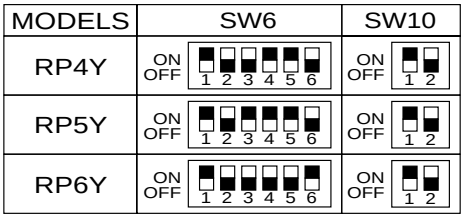
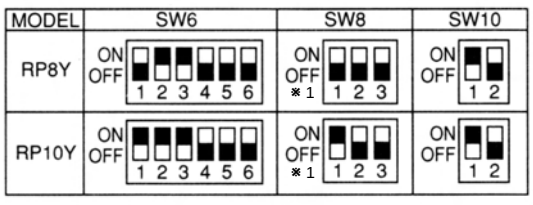
The compressor operating frequency can be fixed by setting the SW2 (a switch of “A Control Service Tool PAC-SK52ST) and turning on/off the SW5-1 on the controller board. However, the setting may not be fixed to the desired value in case of a couple of minutes right after the start-up, in case the operating frequency is limited to some extents by various restrictive controls such as the SW7-3 to 6 settings and in case the operating frequency is set to be out of the operating frequency range designated for each model. Check the operating frequency on the LED display of the outdoor unit every time the setting is changed.

0 : OFF
1 : ON

SW2						Setting
1	2	3	4	5	6	Hz
0	0	0	0	0	0	20
0	0	1	0	0	0	30
0	1	0	1	0	0	43
0	0	0	0	1	0	53
1	0	0	1	1	0	63
1	1	0	0	0	1	73
0	0	1	1	0	1	83
0	0	1	0	1	1	94
0	1	0	1	1	1	108
1	1	1	1	1	1	118

※ Frequency can be set by the combination of the 6-bit binary digit as shown above. (SW2-1 stands for the lowest bit, and SW2-6 stands for the upper bit.)

9-2-2. Function of connectors and jumpers

<table>
<tr><th rowspan="2">Types</th><th rowspan="2">Connector</th><th rowspan="2">Function</th><th colspan="2">Action by open/ short operation</th><th rowspan="2">Effective timing</th></tr>
<tr><th>Short</th><th>Open</th></tr>
<tr><td>Connector</td><td>CN31</td><td>Emergency operation</td><td>Start</td><td>Normal</td><td>When power supply ON</td></tr>
<tr><td rowspan="6">SW6
or
Jumper
(RP1.6-6VHA)</td><td>SW6-1
(J1)</td><td rowspan="6">Model select</td><td colspan="3" rowspan="6">○:ON(Short) ×:OFF(Open)
<table>
<tr><th>Model \ SW6(JP)</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr>
<tr><td>PUHZ-RP1.6VHA</td><td>×</td><td>×</td><td>×</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>PUHZ-RP2VHA</td><td>×</td><td>×</td><td>○</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>PUHZ-RP2.5VHA</td><td>×</td><td>×</td><td>×</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>PUHZ-RP3VHA</td><td>×</td><td>×</td><td>○</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>PUHZ-RP4VHA</td><td>×</td><td>×</td><td>×</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>PUHZ-RP5VHA</td><td>×</td><td>×</td><td>○</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>PUHZ-RP6VHA</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>○</td></tr>
</table></td></tr>
<tr><td>SW6-2
(J2)</td></tr>
<tr><td>SW6-3
(J3)</td></tr>
<tr><td>SW6-4
(J4)</td></tr>
<tr><td>SW6-5
(J5)</td></tr>
<tr><td>SW6-6
(J6)</td></tr>
<tr><td>SW
(RP4-6YHA)</td><td>SW6
SW10</td><td>Model select</td><td colspan="3"> 
</td></tr>
<tr><td rowspan="10">SW
(RP8,10YHA)</td><td>SW6-1</td><td rowspan="10">Model select</td><td colspan="3" rowspan="10"> 
</td></tr>
<tr><td>SW6-2</td></tr>
<tr><td>SW6-3</td></tr>
<tr><td>SW6-4</td></tr>
<tr><td>SW6-5</td></tr>
<tr><td>SW6-6</td></tr>
<tr><td>SW8-1</td></tr>
<tr><td>SW10-1</td></tr>
<tr><td>SW10-2</td></tr>
</table>

※ 1 As for SW8, see also 9-2-1. Function of switches, as SW8 sets the replacement operation as well.

Special function

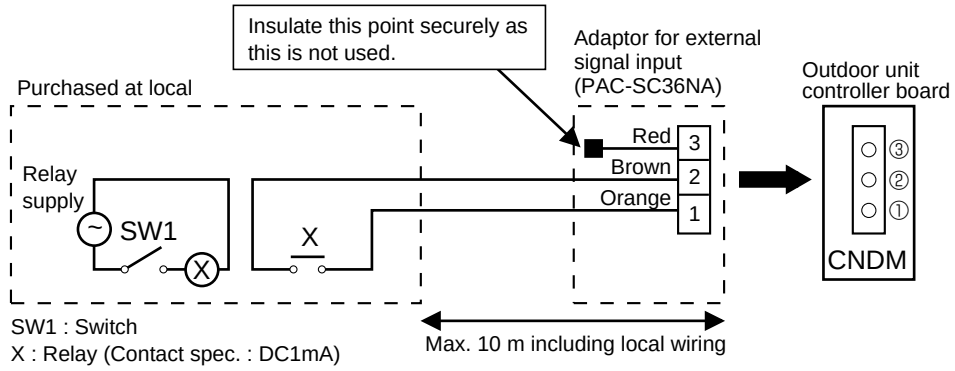
(a) Low-level sound priority mode (Local wiring)

Unit enters into Low-level sound priority mode by external signal input setting.
Inputting external signals to the outdoor unit decreases the outdoor unit operation sound 3 to 4 dB lower than that of usual.
Adding a commercial timer or on-off switch contactor setting to the CNDM connector which is optional contactor for Demand input located on the outdoor controller board enables to control compressor operation frequency.

※ The performance is depends on the load of conditioned outdoor temperature.

How to wiring

<Low-level sound priority mode circuit>



1) Make the circuit as shown above with Adaptor for external signal input(PAC-SC36NA).
2) Turn SW1 to on for Low-level sound priority mode.
   Turn SW1 to off to release Low-level sound priority mode and normal operation.

(b) On demand control (Local wiring)

Demand control is available by external input. In this mode, power consumption is decreased within the range of usual 0~100%.

How to wiring

Basically, the wiring is the same (a).
Connect an SW 1 which is procured at field to the between Orange and Red(1 and 3) of the Adaptor for external signal input(PAC-SC36NA), and insulate the tip of the brown lead wire.

It is possible to set it to the following power consumption (compared with ratings) by setting the SW7-1, 2.

SW7-1	SW7-2	Power consumption (SW1 on)
OFF	OFF	0% (Operation stop)
ON	OFF	50%
OFF	ON	75%

(c) Refrigerant collecting (pump down)

Perform the following procedures to collect the refrigerant when relocating or replacing the indoor or outdoor units.

①Before collecting the refrigerant, first make sure that the all of the SW5 DIP switches for function changes on the control board of the outdoor unit are set to OFF. If all of the SW5 switches are not set to OFF, record the settings and then set all of the switches to OFF. Now, start refrigerant collecting operation. After moving the unit to a new location and completing the test run, set the SW5 switches to the previously recorded settings.

②Turn on the power supply (circuit breaker).

※When power is supplied, make sure that “CENTRALLY CONTROLLED” is not displayed on the remote controller. If “CENTRALLY CONTROLLED” is displayed, the refrigerant collecting (pump down) cannot be completed normally.

③ Close the liquid stop valve.

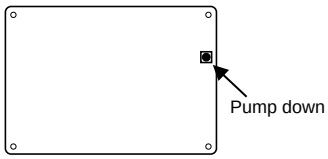
④ Set the SWP switch on the outdoor controller board to ON. The compressor (outdoor unit) and ventilators (indoor and outdoor units) start operating and refrigerant collecting operation begins. LED1 and LED2 on the control board of the outdoor unit are lit.

※Set the SWP switch (push-button type) to ON in order to perform refrigerant collecting operation only when the unit is stopped. However, refrigerant collecting operation cannot be performed until compressor stops even if the unit is stopped. Wait three minutes until compressor stops and set the SWP switch to ON again.

⑤Because the unit automatically stops after the refrigerant collecting operation is conducted for around 2 to 3 minutes, make sure to close the gas stop valve immediately. LED1 is not lit and LED2 is lit at this time. If LED1 is lit and LED2 is not lit at this time, please repeat the procedure from ②.

⑥Turn off the power supply (circuit breaker.)

<Outdoor unit controller board>



9-2-3. Optional parts
A-control Service Tool [PAC-SK52ST]

● Function of switches

(1) Function of switches

Type of switches	Switch	No.	Function	Action by the switch operation		Effective timing
				ON	OFF	
DIP SW	SW2	1	Changing of LED display <Self-diagnosis>	Operation monitor	Operation monitor	Under operation or suspension
		2				
		3				
		4				
		5				
		6				
	SW3	1	Fixing the selected mode <Not applicable>	—	—	—

※ Use SW3 set to OFF.

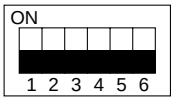
(2) Function of jumpers

Types	Connector	Function	Action by open/short		Effective timing
			Short	Open	
Connector	CN33	Not applicable	—	—	OFF

※ Use CN33 open.

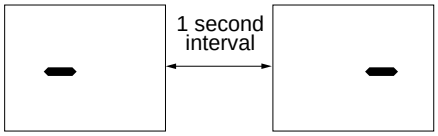
<Outdoor unit operation monitor function>
[When option part 'A-Control Service Tool(PAC-SK52ST)' is connected to outdoor controller board(CNM)]
Digital indicator LED1 displays 2 digit number or code to inform operation condition and the meaning of error code by controlling DIP SW2 on 'A-Control Service Tool'.

Operation indicator SW2 : Indicator change of self diagnosis

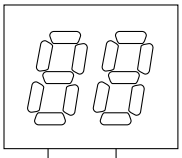
SW2 setting	Display detail	Explanation for display	Unit
			

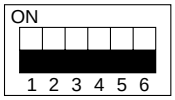
<Digital indicator LED1 working details>
(Be sure the 1 to 6 in the SW2 are set to OFF.)

(1) Display when the power supply ON.
When the power supply ON, blinking displays by turns.
Wait for 4 minutes at the longest.



(2) When the display lights. (Normal operation)
①Operation mode display.

LED1  (Lighting)

SW2


(Initial setting)

The tens digit : Operation mode

Display	Operation Model
O	OFF / FAN
C	COOLING / DRY ※
H	HEATING
d	DEFROSTING

※C5 is displayed during replacement operation. <for RP4~RP6>

The ones digit : Relay output

Display	Warming-up Compressor	Compressor	4-way valve	Solenoid valve
0	—	—	—	—
1	—	—	—	ON
2	—	—	ON	—
3	—	—	ON	ON
4	—	ON	—	—
5	—	ON	—	ON
6	—	ON	ON	—
7	—	ON	ON	ON
8	ON	—	—	—
A	ON	—	ON	—

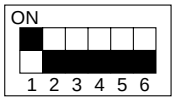
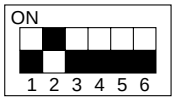
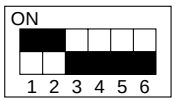
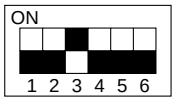
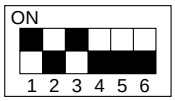
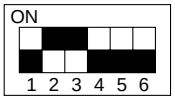
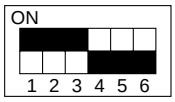
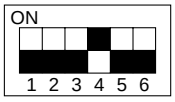
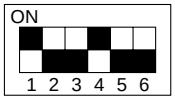
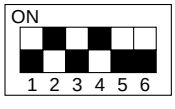
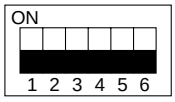
②Display during error postponement
Postponement code is displayed when compressor stops due to the work of protection device.
Postponement code is displayed while error is being postponed.

(3) When the display blinks
Inspection code is displayed when compressor stops due to the work of protection devices.

Display	Inspection unit
0	Outdoor unit
1	Indoor unit 1
2	Indoor unit 2
3	Indoor unit 3
4	Indoor unit 4

Display	Contents to be inspected (During operation)
U1	Abnormal high pressure (63H worked)
U2	Abnormal high discharging temperature, shortage of refrigerant
U3	Open/short circuit of discharging thermistor(TH4)
U4	Open/short of outdoor unit thermistors(TH3, TH6, TH7 and TH8)
U5	Abnormal temperature of heat sink
U6	Abnormality of power module
U7	Abnormality of super heat due to low discharge temperature
U8	Abnormality in outdoor fan motor (RP4~RP6YHA)
UF	Compressor overcurrent interruption (When Comp. locked)
UH	Current sensor error
UL	Abnormal low pressure (63L worked)
UP	Compressor overcurrent interruption
P1~P8	Abnormality of indoor units
A0~A7	Communication error of high-prior signal (M-NET)

Display	Contents to be inspected (When power is turned on)
F3	63L connector(red) is open.
F5	63H connector(yellow) is open.
F9	2 connectors (63H/63L) are open.
E8	Indoor/outdoor communication error (Signal receiving error) (Outdoor unit)
E9	Indoor/outdoor communication error (Transmitting error) (Outdoor unit)
EA	Mis-wiring of indoor/outdoor unit connecting wire, excessive number of indoor units (4 units or more)
Eb	Mis-wiring of indoor/outdoor unit connecting wire(converse wiring or disconnection)
Ec	Startup time over
E0~E7	Communication error except for outdoor unit

SW2 setting	Display detail	Explanation for display	Unit
	Pipe temperature / Liquid(TH3) – 40~90	– 40~90 (When the coil thermistor detects 0℃ or below, "–" and temperature are displayed by turns.) (Example) When -10℃; 0.5 secs. 0.5secs. 2 secs. –□ →10 →□□	℃
	Discharge temperature (TH4) 3~217	3~217 (When the discharge thermistor detects 100℃ or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105℃; 0.5 secs. 0.5secs. 2 secs. □1 →05 →□□	℃
	Output step of outdoor FAN 0~10	0~10	Step
	The number of ON / OFF times of compressor 0~9999	0~9999 (When the number of times is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 42500 times (425 ×100 times); 0.5 secs. 0.5secs. 2 secs. □4 →25 →□□	100 times
	Compressor integrating operation times 0~9999	0~9999 (When it is 100 hours or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 2450 hours (245 ×10 hours); 0.5 secs. 0.5secs. 2 secs. □2 →45 →□□	10 hours
	Compressor operating current. 0~50	0~50 ※Omit the figures after the decimal fractions.	A
	Compressor operating frequency 0~225	0~255 (When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns. (Example) When 125Hz; 0.5 secs. 0.5secs. 2 secs. □1 →25 →□□	Hz
	LEV-A opening pulse 0~480	0~480 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns. (Example) When 150 pulse; 0.5 secs. 0.5secs. 2 secs. □1 →50 →□□	Pulse
	Error postponement code history (1) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement "00" is displayed in case of no postponement.	Code display
	Operation mode on error occurring	Operation mode of when operation stops due to error is displayed by setting SW2 like below. (SW2) 	Code display